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United States  
Department of  
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Tongass  
National Forest

R10-MB-329

August 1996



# King George Timber Sale

## Final Environmental Impact Statement

### Stikine Area

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Stikine Area  
P.O. Box 309  
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File Code: 1950/2430

Date: August 1, 1996

Dear Reviewer:

Here is your copy of the Record of Decision and the Final Environmental Impact Statement for the King George Timber Sale, Stikine Area, Tongass National Forest. The Record of Decision explains my decision to select Alternative 5, which includes the harvest of 26.8 million board feet of timber from 1,393 acres and construction of 10.8 miles of road. The decision implements Alternative 5 as presented in the Final EIS. In response to public comments, Alternative 5 was modified in the Final EIS to address road management and risk of sediment in King George Creek. Additional efforts were also made to address values of the Honeymoon timber volume and impacts to scenic quality from Zimovia Highway on Wrangell Island.

The appeal period will begin the day after we publish notice in the Petersburg Pilot, the official newspaper of record for decisions made by the Stikine Area Forest Supervisor. This date is anticipated to be August 8, 1996. The appeal period will last 45 days. I expect the appeal deadline to fall on September 23, 1996. We will implement the decision no sooner than five working days after the close of the appeal period.

As the Stikine Area Forest Supervisor, I am responsible for this decision. Please direct any correspondence or requests for additional copies to Meg Mitchell, IDT Leader, P.O. Box 51, Wrangell, AK 99929, or call (907)874-2323.

Sincerely,

  
ABIGAIL R. KIMBELL  
Forest Supervisor

Enclosure





# King George Timber Sale

## Final Environmental Impact Statement and Record of Decision

USDA Forest Service  
Alaska Region  
Alaska

Lead Agency:

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P.O. Box 309  
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**Abstract:** This Final Environmental Impact Statement describes the effects of five “action” alternative approaches, and one “no action” approach to harvesting timber in the King George Study Area. The Record of Decision summarizes the reasons the Forest Supervisor chose to implement Alternative 5.



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# Record of Decision

# Record of Decision

## Introduction

This Record of Decision documents my decision to select an alternative from the King George Timber Sale Final Environmental Impact Statement (FEIS) project area on Etolin Island. This decision includes specific harvest unit, road and log transfer site locations and methods of harvest and construction.

The purpose and need of this project is to make available for harvest approximately 15-25 million board feet of timber to (1) carry out the direction in the Tongass Land Management Plan, 2) contribute to providing a sustained volume of wood to meet local and national demands, and 3) provide local and regional employment opportunities. A comparison of the existing and desired conditions in the project area (see Appendix A, FEIS) suggests that approximately 900 to 1,300 acres could be harvested with a variety of silvicultural methods. These silvicultural methods will be designed to maintain stand structure and ecological functions over time while still yielding timber. These methods will leave low, medium and high densities of trees within stands following harvest. Harvesting between 900 to 1300 acres of forest using these methods could yield between 15-25 MMBF of timber. A variety of resources and values will be maintained through the application of ecosystem management principles in the design of the project.

## Decision

It is my decision to select Alternative 5 as described in the FEIS. Several changes were made in this Alternative between the Draft and Final EIS based on public comment. The changes mainly address concerns that the Environmental Protection Agency and State of Alaska had concerning road management and risk of sedimentation in King George Creek. Other changes also addressed the values of the Honeymoon Volume Class 7 stand (brought up by local residents, environmental groups, the State of Alaska, and US Fish and Wildlife Service) and impacts to the scenic quality from Zimovia Highway on Wrangell Island (brought up by local residents). Although the number of sales that can be offered from this EIS is an administrative decision, I wanted to acknowledge and be responsive to the concerns of local residents and the State of Alaska to offer more small sales for potential value-added milling operations. Alternative 5 was modified as follows and the environmental effects are fully disclosed in the FEIS:

- We will harvest **Units 3, 4 and 30** and part of Unit 5 on the Zimovia Face with helicopter partial cuts. The road will be constructed only to Unit 5 thus eliminating

## Record of Decision

the need for the entire segment of road across Zimovia Face. This will address many of the scenic quality concerns of Zimovia Highway residents.

- I am administratively deferring harvest of **Units 6, 10, 15, 20, 23 and 24** as future small sales. This will make about 124 acres and approximately 4 MMBF available to small operators over the next five years.
- The harvest prescriptions for **Units 10-12** were modified. These units were combined into one large unit below the Honeymoon Road and will be logged with a combination of individual tree or group selection and patch cuts. The intent of this prescription is to manage this stand for high quality wood fiber (large trees with clear wood produced by pruning and thinning) sought by operators interested in producing high-value wood products. This prescription also helps maintain the values of the lower portion of the Volume Class 7 Honeymoon Stand by helping perpetuate the patches of large spruce, hemlock and cedar trees in this managed portion of the stand. Harvest in other portions of this stand are deferred. Fragmentation of this stand is minimized by harvesting the portion of the stand below the road and using uneven-aged harvest methods.
- **Road Segment 5** was dropped and **Unit 18** will be harvested entirely by helicopter. This will allow us to minimize soil disturbance and maintain smaller diameter trees within the harvest unit. Islands of trees will also be retained where they are windfirm and there is low risk that they will affect sedimentation of streams in the event they blow over. This changes were made to reduce the risk of sedimentation into King George Creek.
- **Road Segment 4** has two hydrological sites requiring major stream crossing structures. A gate will be placed on the first structure to restrict public motorized access during the intermittent life of the project and after harvest operations are complete in the King George watershed. This will address the need to maintain the wildlife security values of King George Creek while allowing periodic road maintenance access.
- **Road Segment 7** will be a specified road leading as far as Unit 21. The portion of the road into **Unit 22 (Segment 22)** was dropped (under all 'action' alternatives), along with the associated upper stream crossing. After harvest we will block access, remove culverts and restore the natural drainage pattern. This road segment has one major stream crossing at the beginning of the segment which will be removed. Unit 22 will be harvested entirely with helicopter which will minimize ground disturbance and allow us to maintain smaller diameter trees distributed within the unit. Islands of windfirm trees will also be maintained which will not endanger sedimentation of King George Creek in the event they blow over.
- **Road Segment 8** will have all drainage structures removed (log bridges and culverts) beyond and including the first major stream crossing and hydrological site located between Units 25 and 26. The natural drainage pattern will be restored in the closed road segment.
- **Road segments beyond the gate** in Segment 4 (just beyond Unit 17), which do not have their drainage structures removed, will be maintained and be capable of intermittent administrative vehicle access. Safe-guard measures (overflow dips) will also be implemented at stream crossings to help minimize effects on water quality should a minor structure fail after the intermittent life of the project. All major

# Record of Decision

stream crossings at hydrological sites beyond the gate with the exception of the bridge across King George Creek will be removed after harvest.

The selected alternative (Alternative 5) as described in the FEIS has the following key features:

- **Road Construction-** Approximately 10.8 miles of road would be constructed beyond a low angle ramp LTF just north of Honeymoon Creek.
- **Road Management-** During and following the intermittent life of the project, approximately 4 miles of road will remain open and allow motorized use by the public. We will allow motorized public access of the Honeymoon Creek watershed but restrict motorized access in the King George Creek watershed to mitigate effects of the sale on wildlife habitat security. Almost 3 miles of road will be closed by removing stream crossing structures or culverts and restoring natural drainage patterns. On the remaining portion of road only occasional administrative access will be allowed for small sales, monitoring, habitat improvement projects and maintenance of the road and drainage structures. Safe-guard measures will be implemented in concert with regular maintenance to further reduce sedimentation risk (see Road Cards in Appendix B, FEIS).
- **Timber Harvest-** Harvest would occur on 1,393 acres using a variety of silvicultural prescriptions that leave various amount of green trees within harvest units. Approximately 75% of the harvest prescriptions will leave 30% or more green tree retention and will not be clearcut (see Unit Cards in Appendix B, FEIS).
- **Volume-** Harvest will yield approximately 26.8 Million Board Feet (MMBF) of timber.
- **Old Growth Habitat Areas-** Large areas of operable commercial forest land will be retained in an old-growth condition for the life of the project. These areas include habitat along streams, beach and estuary fringes and large blocks of old growth forest. The streamside buffers required by the Tongass Timber Reform Act are permanent designations. There are 2,079 acres designated to be retained in contiguous block of old-growth for the life of the project (see Designated Old Growth Retention (page 2-13, FEIS). This area encompasses some of the most valuable wildlife habitat and travel corridors in the project area near the King George Creek estuary and along Red Mountain face. In addition, more than 80% of the Suitable Forest Lands (those lands that have productive forest with greater than Volume Class 4 minus stream buffers and extreme hazard soil areas) will be left in an old growth condition after harvest.

## Public and Other Agency Involvement

Public involvement occurred early and throughout the planning process through a variety of scoping letters, open houses and meetings or phone conversations with other agencies and interested groups and individuals.

- In June, 1995 a Notice of Intent to prepare an EIS was published in the Federal Register.
- Public comments on the Draft Environmental Impact Statement were received from April 26 to June 10, 1996.

The Final EIS identifies the agencies that were informed and/or involved in the planning process (see Chapter 5, FEIS). Several agencies have been involved in review of the EIS and the need to acquire necessary permits. These agencies are described on page 1-6 of the FEIS.

# Record of Decision

Through these above contacts, four key issues emerged which became the central focus of the analysis and alternatives:

- Scenic and Recreation Resources
- Timber Sale Economics and Road Management
- Freshwater Systems and Estuaries
- Wildlife Habitat Conservation

The effects on several other issues were evaluated early in the planning process and were considered minor issues because they were easily addressed by all alternatives or were less important to the public in this particular project area. For brevity of the document, effects on these resources are summarized at the end of Chapter 3. These environmental considerations included:

- Subsistence
- Cultural and Archeological Resources
- Soil and Vegetative Productivity
- Sensitive Plants
- Irreversible and Irretrievable Commitments of Resources and Unavoidable Effects
- Wild and Scenic Rivers

## Reasons for the Decision

In making my decision, I first examined each alternative's responsiveness to the key environmental issues identified in the FEIS. All alternatives were compatible with desired conditions we wanted to maintain in the project area and provide key corridors to other areas on Etolin Island (see Appendix A).

Alternative 5 addresses key public issues in the following ways:

The design of Alternative 5 is responsive to **Scenic Resource** concerns by harvesting less than 10% of the key viewsheds with predominantly partial cut methods. Modifications in the selected alternative between the Draft and Final EIS minimized visual concerns expressed by Zimovia Highway residents. Harvest will be noticed but appear like natural openings to the casual observer. The log transfer site is as small and unobtrusive as possible and the sort yard is located away from the beach and viewers. These harvest conditions also help retain the potential economic value of the area for tourism.

**Wildlife habitat conservation** objectives may be met by harvest prescriptions that maintain 50% or greater of the basal area within harvest units. Other harvest prescriptions that maintain less green trees will help provide greater stand diversity within managed stands important to some species. In addition, this alternative would harvest only 1/3 of the available and manageable acres for timber harvest (with all buffers and reserve areas subtracted) and only 20% of the suitable lands (lands with greater than volume Class 4 timber with all stream buffers and extreme soil hazard areas subtracted). A large old-growth reserve area encompasses some of the most valuable wildlife habitat in the project area in the King George watershed. Closure of the road to motorized public use will help mitigate effects of human use and make the reserve area more effective in providing for wildlife habitat security. Fragmentation of the "Honeymoon stand" is minimized as much as possible without completely deferring harvest.

The health and productivity of **freshwater systems and estuaries** is maintained by buffers and the extensive use of other than clearcut harvest methods. Aerial yarding by helicopter also will minimize soil disturbance on the majority of acres harvested. Several

## Record of Decision

modification were made between the Draft and Final EIS to further minimize risk of sediment delivery to King George Creek. Road maintenance objectives strike an effective balance between providing access for cost efficient maintenance while restricting motorized public use in the King George watershed in response to wildlife habitat security concerns. Alternative 5 avoids wetland impacts where practicable. Site specific measures described in Appendix B help maintain wetland soil, water and vegetation functions. The location of the road on the north side of Honeymoon Creek helps accomplish this as well as reduce potential cumulative impacts of future roading to access timber on both sides of the creek.

Several of you, in commenting to the DEIS, stated that you were disappointed in the selection of Alternative 5 as the preferred alternative because it harvests the most timber. There is an inherent assumption that selecting an alternative in the 'mid- or low range' of timber harvest volumes is the only way to be responsiveness to environmental issues. This assumption is made, while at the same time, expecting a larger range of alternatives. I do not agree with these assumptions in this case for the reasons I have outlined above. Differences in alternatives will always be 'relative.' The expectations associated with reaching 'compromises' or a 'balance' will therefore always appear to be met by selecting the 'middle' alternative.

In this project, I examined the responsiveness of all alternatives to the key issues and made my decision in light of the project location while keeping the regional timber supply situation in mind. I selected the alternative with the most timber harvest because I feel it more accurately depicts our intent to manage the project area over time for a combination of small and large sales. In offering this timber for sale, the Forest Service does not control who buys it. However, the project area's location next to Wrangell, immediately across from the Pat's Creek LTF, makes the project area perfectly situated to supply a combination of large and small sales over time for potential processors in Wrangell. Some of these sales may supply value-added wood processing operations.

The economic conditions of Southeast Alaska can not support only small value-added processing operations. Larger sales must be offered in areas with greater dependency on more expensive helicopter operations and to develop road systems which smaller operators can then use. These are the conditions and economic opportunities in the King George planning area. Given the economic situation in Wrangell, I felt that selecting an alternative that would harvest the most volume in the next five years and satisfy both larger and smaller independent sale buyers while meeting other resource desired conditions is the best balance. Even if the buyer is not based in Wrangell, a sale from a project area this close to Wrangell will provide jobs and economic benefits to the community.

The Regional timber supply situation was also a factor in my decision. Timber market assessments confirm that there is underutilized mill capacity in the region and a strong market for wood products. This sale will be offered to meet a regional commitment of independent sale volume. Alternative 5 best meets economic needs while incorporating extensive measures to meet scenery, habitat conservation and freshwater system objectives.

## Alternatives

A total of six alternatives were considered in the FEIS including the 'No Action' Alternative. An alternative to harvest approximately 30 MMBF was dropped early in the planning process after a landscape level analysis (see Appendix A) showed that desired resource conditions could not be met by harvesting that amount of volume. The six alternatives were:

**Alternative 1-** Harvested timber entirely by helicopter within a mile from saltwater. This alternative was primarily responsive to freshwater system and habitat conservation issues. The alternative harvests 14.1 MMBF on 888 acres.

**Alternative 2-** Minimized fragmentation by harvesting at the head of each drainage. Most of the harvest occurs in the 'interior' portion of the planning area. This alternative was primarily responsive to scenery, freshwater systems and habitat conservation issues. This alternative also investigated the option of putting the road on the south side of Honeymoon Creek to minimize impacts on the high volume, south-facing stands along Honeymoon Creek. The alternative harvests 19.5 MMBF on about 968 acres.

**Alternative 3-** Concentrated harvest in Honeymoon and Upper King George Creek but did not harvest along Zimovia Face or lower King George Creek land units, mainly in response to scenery and freshwater system issues. The alternative harvests 16.7 MMBF from about 894 acres.

**Alternative 4-** Concentrated harvest in only the Honeymoon Creek watershed, mainly in response to habitat conservation and freshwater system issues. The alternative harvests 16.2 MMBF from about 943 acres.

**Alternative 5-** Was identified as the Proposed Action and Preferred Alternative in the DEIS. It proposes the most harvest by harvesting across the planning area while being responsive to the desired conditions for all four key issues. This alternative is the Forest Supervisor's selected alternative.

## Environmentally Preferred Alternative

The 'No Action' Alternative would cause the least environmental disturbance and is therefore the environmentally preferred alternative of all the alternatives studied in detail. Of the 'action' alternatives, Alternative 1 is the environmentally preferred action alternative. This alternative would involve no road construction and minimize impacts to wildlife habitat and streams.

## Mitigation

Mitigation includes measures taken to avoid, reduce or minimize the adverse effects of actions. These measures are described in Chapter 2 of the FEIS and the Road and Unit Cards in Appendix B. These measures are adopted as part of this decision and will be implemented as part of the selected alternative.

## Monitoring

Monitoring requirements are specified in Appendix C in the FEIS. These implementation and effectiveness monitoring items are adopted as part of this decision and will be implemented. Each monitoring item describes what the item is, where, when and how it will occur. The monitoring item will be implemented even if available funding may affect the intensity of the monitoring effort.

## Findings Required by Law

This decision is consistent with the **Alaska Regional Guide and the Tongass Land Management Plan** of 1979 (as amended in 1985/86). The areas of undisturbed old-growth wildlife habitat maintained in this alternative meet or exceed the standards for retention established in the Forest Plan. Although not required, the activities authorized in this decision are as consistent as practicable with the proposed standards and guidelines of the Revised Supplement to the Draft EIS for the Tongass Land Management Plan. Options to implement the Revised Forest Plan alternatives were maintained where practicable while still meeting current Forest Plan management direction and schedule of activities.

In accordance with the **National Forest Management Act** and the areas designation as a LUD III, clearcutting is not the predominant harvest method proposed on 75% of the harvest acres. The remaining 25% have a stand management objective of timber production accomplished by a single regeneration harvest with green tree retention of about 10%. In these areas, I have determined that the use of clearcutting with individual green tree retention is optimal due to the need to favor regeneration of Sitka spruce, increase natural regeneration and timber production in the central portion of the study area, and lower logging costs by using cable systems. There are no units that create an opening over 100 acres in size.

The selected alternative is not anticipated to have direct, indirect or cumulative effects on any threatened, endangered or sensitive species in the project area. A complete biological assessment is included in the planning record for this project. The U.S. Fish and Wildlife Service and the National Marine Fishery Service have concurred with the conclusion of the Wrangell Ranger District biologist that the actions described are not likely to adversely affect threatened and endangered species. I have determined that this action will not have any adverse impacts on threatened and endangered species and is consistent with the **Endangered Species Act**.

Harvest units were designed and will be located to maintain minimum 100-foot buffers for all Class I streams and Class II streams which flow directly into Class I streams as required in Section 103 of the **Tongass Timber Reform Act**. The actual widths of these buffers will often be greater than the 100 foot minimum.

Management activities within 330 feet of an eagle nest site are restricted by a Memorandum of Understanding (MOU) between the Forest Service and the U.S. Fish and Wildlife Service to facilitate compliance with the **Bald Eagle Protection Act**.

# Record of Decision

The design of harvest units and roads for all alternatives, including the selected alternative, were guided by standards, guidelines and direction contained in the current Tongass Land Management Plan, Alaska Regional Guide, and applicable Forest Service Manuals and handbooks. The unit and road cards (Appendix B) contain specific details on practices prescribed to prevent or reduce non-point sediment sources. Reasonable implementation with site specific application and monitoring of approved Best Management Practices (BMPs) is expected to comply with applicable **State Water Quality Standards and Regulations**. The State of Alaska's comments made during the Alaska Coastal Management Program review, and the Environmental Protection Agency comments, were incorporated into the selected alternative.

Cultural resource surveys of various intensities have been conducted in the project area. The State Historic Preservation Officer has been consulted and the project is consistent with the provisions of **36 CFR part 800**. I have determined that there will be no significant effects on cultural resources.

A subsistence evaluation was conducted for the six alternatives considered in detail in accordance with **ANILCA Section 810**. The full analysis is located in the planning file for this project and summarized in Chapter 3 of the Final EIS. The evaluation of scoping and additional analysis indicate that there is no significant possibility of a significant restriction on subsistence uses for wildlife, fish and shellfish, marine mammals, other foods, and timber resources.

**Executive Order 11988** directs federal agencies to avoid, to the extent possible, the long and short-term adverse impacts associated with the occupancy and modification of floodplains. The numerous streams in the project area make it impossible to avoid all floodplains during timber harvest and road construction. The design of the proposed developments, harvest prescriptions, reliance on helicopter logging and the application of Best Management Practices combine to minimize adverse effects to floodplains.

**Executive Order 11990** requires Federal Agencies to avoid, to the extent possible, the long and short-term adverse impacts associated with the destruction or modification of wetlands. The amount of wetlands in the project area (much of it peatlands) makes it impossible to avoid wetlands entirely. Therefore, soil moisture regimes and vegetation on some wetlands may be altered in some cases. Harvest occurring on wetlands would still be classified as wetlands and function as wetlands in the ecosystem. Roads were designed to avoid wetlands as much as possible (except Alternative 2 which considered a road on the south side of Honeymoon Creek to show the trade-off associated with avoidance of the "Honeymoon Stand"). Less than 5% of the wetlands (all types) within the project area are affected by harvest units or roads in the selected alternative.

The **Coastal Zone Management Act (CZMA)**, while specifically excluding Federal lands from the Coastal Zone, requires that a Federal agency's activities be consistent with the enforceable standards of a state's coastal management program to the maximum extent possible. The enforceable standards for timber harvest activities are found in the State Forest Practices Act. The standards and guidelines for timber management in the King George Project Area meet or exceed the standards in the State Forest Practices Act. The Division of Governmental Coordination did a consistency review of our determination for Alternative 5 in the DEIS. I have addressed their recommendations between Draft and Final and incorporated them into Alternative 5 described in the FEIS and this ROD. I have therefore determined that the selected alternative is consistent with the Alaska Coastal Management Program to the maximum extent practicable.

# Record of Decision

I have determined that this action will not adversely affect prime farmland, range land, rivers eligible for Wild and Scenic River designation, standards associated with the Clean Air Act, Wilderness or civil rights, women, and minorities. The State and Federal permits necessary to implement the authorized activities are listed in Chapter 1 of the FEIS.

## Implementation

Implementation of this decision may occur no sooner than 50 days following publication of the legal notice of the decision in the Petersburg Pilot (expected to be August 8, 1996), published in Petersburg Alaska. Publication of the Notice of Availability of the Final EIS in the Federal Register will be concurrent and is anticipated to be August 9. The first timber sale from this project is planned to be offered in the Fall of 1996.

Implementation of all activities authorized by this Record of Decision will be monitored to ensure that they are carried out as planned and described in the Final EIS. The Appendix of this document contain the Harvest Unit and Road design cards. These cards are an integral part of this decision because they document key implementation measures that ensure resource concerns are addressed.

Proposed changes to the authorized project actions will be subject to the requirements of the National Environmental Policy Act (NEPA), the National Forest Management Act, the Tongass Timber Reform Act, the Coastal Zone Management Act, and other laws concerning such changes. Minor changes are expected during implementation to better meet on-site resource objectives. Minor adjustments to unit boundaries are also likely during final layout for the purpose of improving logging system efficiency. Many of these minor changes will not present sufficient potential impacts to require any specific documentation or other action to comply with applicable laws. Some changes may require further analysis and documentation to comply with Forest Service Handbook 1909.15, sec. 18. If the Forest Supervisor determines that the change is both substantive and relevant to environmental concerns, it will require a supplement to the existing EIS. If the change is not considered substantive enough to be relevant to environmental concerns, the change will be documented in the implementation record. Cards similar to the unit and road cards will be used to document changes between planned and implemented features of the Selected Alternative.

## Right to Appeal

This decision is subject to administrative appeal. Organizations or members of the general public may appeal this decision according to Title 36 Code of Federal Regulations (CFR) 215. The appeal must be filed within 45 days of the date that legal notification of this decision is published in the Petersburg Pilot, the official newspaper of record. The Notice of Appeal must be filed in duplicate with:

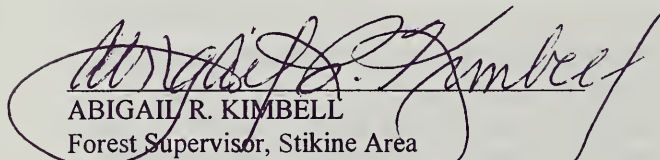
Phil Janik, Regional Forester  
Forest Service  
U.S. Department of Agriculture  
P.O. Box 21628  
Juneau, AK 99802-1628

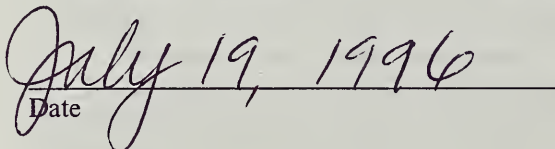
## Record of Decision

It is the responsibility of those who appeal a decision to provide the Regional Forester with sufficient written evidence and rationale to show why the decision by the Forest Supervisor should be changed or reversed. This written Notice of Appeal must:

1. State that the document is a Notice of Appeal filed pursuant to 36 CFR Part 215;
2. List the name, address and if possible, the telephone number of appellant;
3. Identify the decision document by title and subject, date of the decision, and name and title of the Responsible Official;
4. Identify the specific change(s) in the decision that the appellant seeks or portion of the decision to which the appellant objects;
5. State how the Responsible Official's decision fails to consider comments previously provided, either before or during the comment period specified in 36 CFR 215.6 and, if applicable, how the appellant believes the decision violates law, regulation or policy.

For Additional information concerning this decision, contact Meg Mitchell, Forest Service Interdisciplinary Team Leader, Wrangell Ranger District, P.O. Box 51, Wrangell, AK 99929, or call (907) 874-2323.

  
ABIGAIL R. KIMBELL  
Forest Supervisor, Stikine Area  
Tongass National Forest

  
Date

# Summary



# Summary

If you have limited time to review this document, this summary and Chapters 1 and 2 will give you a good overview of this project, and the environmental effects. We kept these sections concise to facilitate your review.

**Chapter 1** discusses the reason we are considering harvesting timber in the King George Study Area and is a good place to look if you want a summary of our response to public comments. One of the most important functions of public comment is to help us identify the key planning issues for the project. The public comments we received showed that there were four main issues that people really cared about. We outline these four issues, and how we plan to measure the alternatives against them, starting on page 1-6:

- **Scenic and Recreation Resources**
- **Timber Sale Economics & Road Management**
- **Freshwater Systems and Estuaries**
- **Wildlife Habitat Conservation**

*Chapters 1 and 2 give a good overview.*

**Chapter 2** discusses the different alternatives we designed, based on the public comment we received. The **Proposed Action** (Alternative 5 in this document), proposes the highest level of harvest that could occur in the King George Study Area. It is described in detail, starting on page 2-1. **Alternative 1** (page 2-4) responds primarily to public concerns about freshwater systems, and habitat conservation. It is also the only alternative that fully relies on helicopter yarding of the timber from harvest units. **Alternative 2** (page 2-6) responds to scenery concerns by focusing harvest in the interior and northern part of the study area. It is also the only alternative that proposes a road on the south side of Honeymoon Creek. **Alternative 3** (page 2-8) emphasizes scenery and freshwater systems concerns by proposing very light cutting on Zimovia Face, and avoiding the Lower King George area. **Alternative 4** (page 2-10) responds to concerns over economic return, freshwater systems, and habitat conservation by avoiding the entire King George watershed. This alternative also proposes the least amount of road of all the alternatives that propose roads. The **No Action Alternative** (Alternative 6 in this document) proposes no change to the existing environment in the King George Study Area. A chart located at the end of this summary reviews the major effects and features of each alternative.

## Summary

The **Preferred Alternative** is described at the end of Chapter 2. We've selected Alternative 5, the proposed action, as our preferred alternative. Several adjustments were made to Alternative 5 between the draft and final EIS in response to public and other agency comments. These changes are described in detail at the end of Chapter 2.

*Chapter 3 describes the effects.*

**Chapter 3** discusses the existing conditions in the King George Study Area, and provides analysis showing how harvesting timber in this area will change these conditions. The main analysis in this chapter examines how the six alternatives differ, with respect to the key planning issues described in Chapter 1.

*Extra alternative maps are at the back of Appendix B.*

The **Appendix** describe key findings of the Etolin Island landscape analysis and King George desired conditions we want to maintain over time (**Appendix A**), the Unit and Road cards which show specific boundaries, mitigation measures and harvest methods (**Appendix B**), the Monitoring and Improvement projects (**Appendix C**), information about the LTF (**Appendix D**), a comparison of actions with the proposed Anadromous Fish Habitat Assessment Report recommendations (**Appendix E**), a review of our road management strategies (**Appendix F**) and copies of public comments and our responses to the Draft Environmental Impact Statement (**Appendix G**).

**Extra alternative maps** are located at the end of Appendix B so that you can remove them and refer to them as you review the document.

Table S-1, briefly summarizes the features and impacts of each alternative on the four key issues.

# Summary

Table S-1, Alternative Comparison Table

	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6
Visible Acres Harvested in Zimovia Strait Viewshed	258 (9%)	67 (2%)	157 (5%)	259 (9%)	259 (9%)	0
Visible Acres Harvested in Chichagof Pass Viewshed	131 (5%)	131 (5%)	131 (5%)	131 (5%)	131 (5%)	0
Visible Acres Harvested in Stikine Strait Viewshed	175 (3%)	235 (4%)	65 (1%)	155 (2%)	374 (6%)	0
Visible Acres Harvested in Bessie Peak Viewshed	95 (2%)	438 (7%)	385 (6%)	208 (4%)	533 (9%)	0
Volume	14,060 MBF	19,500 MBF	16,700 MBF	16,170 MBF	26,840 MBF	0
Percent of Manageable Acres Treated	21%	23%	21%	22%	33%	0%
Miles of Road Construction	0	10.8	7.7	5.3	10.8	0.0
Miles of Road Open to Motorized Vehicles (after harvest)	0	4.0	4.4	3.8	4.0	0
Net Stumpage	\$23/MBF	-\$3/MBF	\$12/MBF	\$11/MBF	\$10/MBF	0
Critical Stream Crossings	0	10	5	1	7	0
Acres Harvested in Freshwater System	260	560	480	350	790	0
Miles of Road in Freshwater System	0	9.8	6.7	3.3	9.7	0
Wetland Acres Harvested	116	138	157	146	202	0
Wetland Acres Roaded	0	22	9	4	15	0
Acres Harvested on Mod to High Hazard soils	205	348	280	255	379	0
# Feet of Road Construction on Moderate to High Hazard Soils	0	2,812	0	0	5,679	0

Scenery Values

Economics

Freshwater System

# Summary

	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6
Habitat Capability as a % of Current Condition for:						
Deer	97%	94%	96%	96%	92%	100%
Marten	95%	94%	95%	95%	90%	100%
Black Bear	99%	99%	96%	96%	96%	100%
Red Squirrel	96%	95%	96%	96%	92%	100%
Hairy						
Woodpecker	91%	88%	90%	90%	84%	100%
Brown Creeper	97%	90%	95%	96%	86%	100%
Travel Corridor						
Maintained to:						
Chichagof Face	Yes	Yes	Yes	Yes	Yes	Yes
Honeymoon	Yes	No	No	No	No	Yes
Red Mountain	Partial	Partial	Yes	Partial	Partial	Yes
Kunk Lake	Yes	Partial	Partial	Yes	Partial	Yes
Fishtrap						
Drainage	Partial	Partial	Yes	Yes	Partial	Yes
Acres in Patches Larger Than:						
5,000 Acres	0	0	0	0	0	5,890
1,000 Acres	8,350	7,660	8,220	8,220	7,591	10,140
500 Acres	8,350	8,590	9,065	8,220	7,591	10,140
180 Acres	9,050	9,000	9,335	9,055	8,382	10,550
Weighted Mean Old Growth Block Size	1,960	1,350	3,120	1,860	1,155	5,390

Habitat Conservation

# Chapter 1

## Purpose and Need for Action

# Chapter 1

History and Method of  
Action

Introduction

Methodology

History

Method

Action

# Chapter 1

## Purpose and Need for Action

### Introduction: This Document and You

Thank you for your interest in the proposed King George Timber Sale. This Environmental Impact Statement (EIS) documents our efforts to make decisions about a possible timber sale within the King George Study Area based upon laws and other direction and upon public needs and concerns.

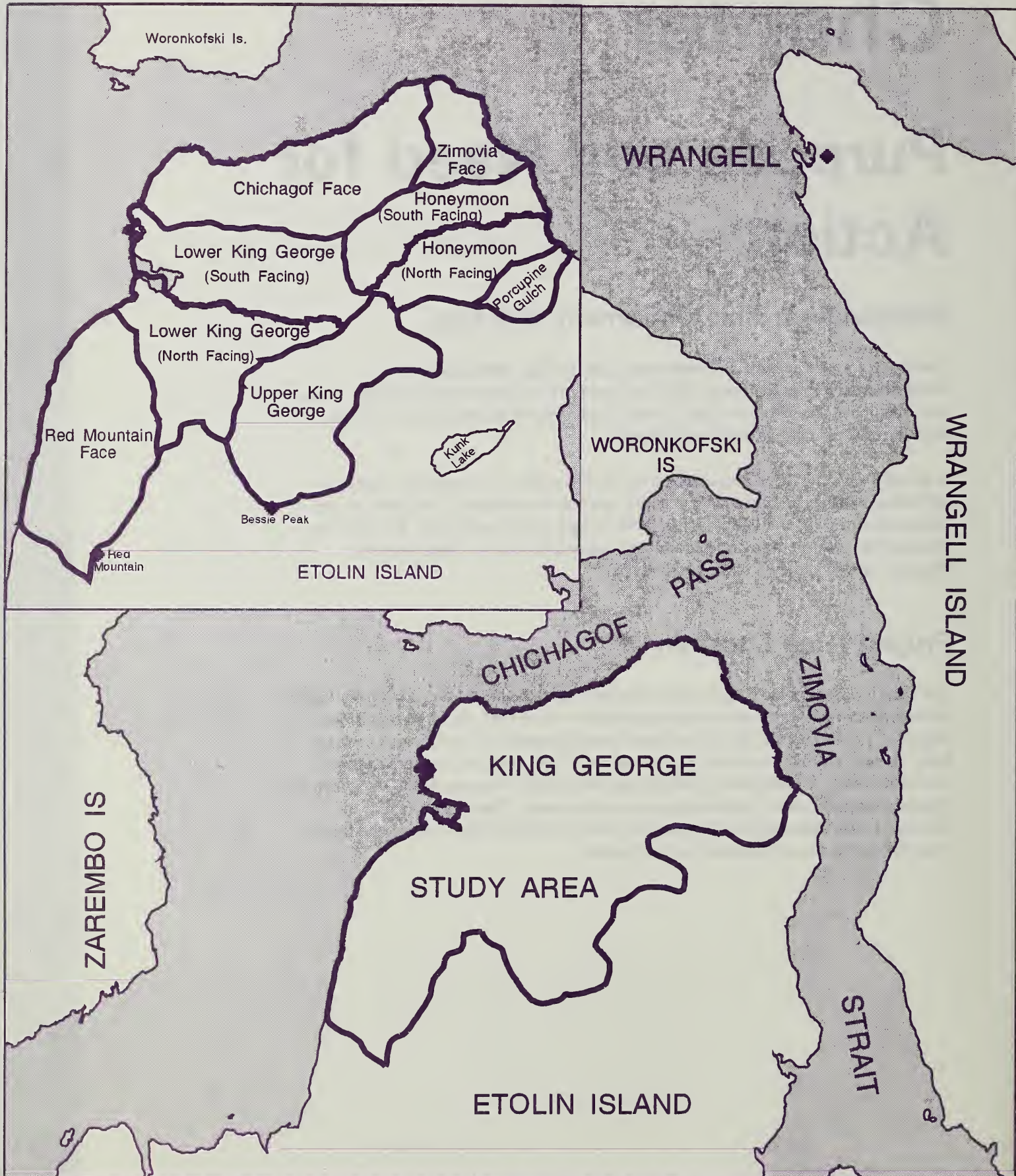
In this EIS we describe a “Proposed Action” and five other alternative approaches to harvesting timber, building and maintaining roads and constructing a log transfer site within the area on Etolin Island known as the King George Study Area. We have also disclosed the environmental effects and resource outputs that we expect from the Proposed Action and each of the alternatives.

### Project Area Location

The King George Timber Sale Study Area is located on the northern end of Etolin Island in Southeastern Alaska about 10 miles south-southwest of the town of Wrangell (See Figure 1-1). Much of the 16,300 acre study area is drained by King George Creek into King George Bay to the west and by Honeymoon Creek which empties into Zimovia Strait to the east. To help better plan and show the effects of harvest in the study area, we divided it up into smaller watersheds known as land-units. These areas include the Chichagof face, Zimovia face, Honeymoon Creek, Porcupine Gulch, Upper and Lower King George, and Red Mountain face land units.

# 1 - Purpose of and Need for Action

Figure 1-1: Project Area Map



# 1 - Purpose of and Need for Action

## Overall Direction for the Project

**Tongass Land Management Plan-** The Tongass Land Management Plan (TLMP or Forest Plan) provides broad management direction for the lands and resources in the Tongass National Forest in Southeast Alaska. Forest goals, anticipated outputs, management area emphasis descriptions, and schedules of proposed management activities are included in the Forest Plan. The Forest Plan designates one of four Land Use Designations (LUD's) to land areas: LUD I (Wilderness Areas), LUD II (Roadless Areas), LUD III (areas that emphasize balancing both amenity and commercial uses), and 4) LUD IV (areas that emphasize intensive resource development).

**Land Use Designations-** The study area includes all of Value Comparison Unit (VCU) 462. In the Forest plan, this VCU is allocated to a Land Use Designation (LUD) of III. We are to manage LUD III lands for a variety of commodity and amenity uses. The emphasis is on managing for uses and activities in a compatible and complimentary manner to provide the greatest combination of both commodity and amenity benefits. These areas have either high use or high amenity values in conjunction with high commodity values.

*The Forest Plan emphasizes timber harvest that is compatible with amenity uses.*

**Management Area Direction/Emphasis-** The Forest Plan further allocates VCU 462 to the North Etolin Management Area (S23) and states: *"Management in this area (North Etolin) will emphasize the development of an interconnected road system for timber management and other resource uses if economically and environmentally feasible. However, the geography will require development of some separate systems... Recreation opportunities/potential will be protected at Steamer Bay, Three-way Passage, Rocky Bay, Mosman and Burnett Inlet... Wildlife habitat improvement should be developed along with timber sale activities wherever practical. Major visual quality objectives will range from partial retention to maximum modification with the higher quality objectives in the areas seen from the Clarence and Stikine Straits ferry route and Zimovia Strait small boat route. The Retention Visual Quality Objective (activities will not be noticed) will normally apply to the immediate vicinity of specific recreation features."* The Forest Plan also specifies the method we use to set aside or manage key areas of essential habitat for wildlife and fish species (primarily old-growth forest) within areas that would otherwise meet timber scheduling criteria.

**Revision of the Tongass Land Management Plan-** The Forest Plan is presently being revised in order to better reflect the public's needs on the Tongass. This new Forest Plan will give direction to the project area. Presently, the Supplement to the Draft Environmental Impact Statement for the Revision has alternatives that allocate the project area to a spectrum of possible land uses including Scenic Viewshed, Modified Landscape, and Timber Production prescriptions. The preferred alternative of the Draft Revision allocates the area to a combination of Scenic Viewshed (along Stikine Strait, Chichagof Pass and Zimovia waterways) and Modified Landscape (in the center valleys of King George and Honeymoon creeks) which acknowledges the visibility and scenic importance of the King George Study area. Other important guidelines proposed by the plan include the implementation of stream, beach and estuary buffers. The projects and activities proposed and analyzed in this EIS are consistent with the current Forest Plan. To the extent practical, we have also aimed for consistency with the guidelines currently being studied in the Revision.

# 1 - Purpose of and Need for Action

## Desired Future Condition

*The desired condition for the planning area is summarized in Appendix A.*

After examining the intent and direction in the Forest Plan, we studied the potential of the study area to provide for timber harvest, balance amenity and commodity interests while maintaining important ecological functions. This analysis helped us refine the purpose and need for the project and develop the Proposed Action and other alternatives. Specifically our analysis helped us identify that 900 to 1300 acres could be harvested for timber using a variety of cutting methods to maintain important wildlife habitat, freshwater and riparian system functions and recreation and scenic values. This analysis also helped us understand how possible actions in the King George Study area affect or are "linked" to the rest of the North Etolin Island landscape. This aspect of the analysis helped us formulate a strategy for designating key habitat areas as required by the current Forest Plan. Appendix A summarizes this "desired condition," that all alternatives are designed to achieve.

## Purpose and Need

The purpose and need for this proposal is to make available for harvest approximately 15 to 25 million board feet (MMBF) of timber to (1) carry out direction in the Tongass Land Management Plan, (2) contribute to providing a sustained volume of wood to meet local and national demands and (3) provide local and regional employment opportunities. A comparison of the existing and desired conditions suggests that approximately 900 to 1,300 acres could be harvested with a variety of silvicultural methods. These silvicultural methods will be designed to maintain stand structure and ecological functions over time while still yielding timber. These methods will leave low, medium and high densities of trees within the stands following harvest. Harvesting between 900 to 1300 acres of forest using these methods could yield between 15 to 25 MMBF of timber. A variety of resources and values will be maintained through the application of ecosystem management principles in the design of the project.

## Proposed Action

*What Is Meant by the "Proposed Action"*- At the start of our project planning process we define a "proposed action" so that the public and other agencies can know more about the project. The "proposed action" identified at the start of a project, does not necessarily end up being the "preferred" or final "selected" alternative. For this project, we chose to put forth the alternative with the most potential development (harvesting 1300 acres identified in the desired condition analysis and develop a full road system) as the proposed action so that the public could comment more fully on **all** the possible management actions we envision at this time. We then develop **other alternatives** to the proposed action in response to environmental issues, public concerns and comments from other agencies.

*The proposed action is Alternative 5. In this project, it is also the preferred alternative.*

The Proposed Action (Alternative 5) for this project is to harvest approximately 26.8 MMBF of timber from 1,393 acres. Harvest methods would leave various amounts of trees within units. A variety of log yarding systems would be used including helicopter, cable, skyline and shovel systems. About 10.8 miles of road would be constructed in the Honeymoon and King George Creek valleys. A log transfer site, with a low-angle ramp, would also be constructed just north of Honeymoon Creek. You can find a more detailed description of the Proposed Action and alternatives to the Proposed Action in Chapter 2.

# 1 - Purpose of and Need for Action

## Decision to be Made

The Stikine Area Forest Supervisor will decide; 1) if, where, how and how much harvest will occur in the King George area, 2) how much and where road construction will occur to facilitate harvest and how roads should be managed, 3) where to retain old growth habitat, and 4) what mitigation measures and monitoring will be implemented.

## The Planning Method and Public Involvement

(Comments from King George public scoping appear throughout this document in *italics*.)

*"Many of us feel major decisions are made, and then---as a matter of fulfilling a requirement "public comment" is asked for. This is frustrating and tempts one not to even bother to respond. If you can come up with an alternative in the draft EIS which is not a deficit sale, provides jobs for Alaskans, cuts timber selectively and sells it at a profit to a U.S. craftsman who will prepare and use it to build wood products of beauty and quality, respects the integrity of the land and water and leaves it unharmed in any way, and gets the support of (environmental groups), then you'll have my support too. Good luck."*

When a timber sale project begins, we designate a group of professionals with a variety of educational backgrounds to a team known as an "interdisciplinary team" or IDT. It is the job of this team to listen to public comment, and work with you and the various State and Federal agencies to plan the best possible project. This team conducts the planning process, writes this document and informs you and the Forest Supervisor of the environmental consequences of the alternatives.

We listen to the frustrations many of you have interacting with us. A common complaint is that we have made up our minds to harvest timber in the King George project area. It's true we have a pretty good idea we want to harvest timber there. If we were not serious in our intent to design the best sale possible, we would not waste your time or the taxpayer's dollars going this far with the analysis. The "no action" alternative is a viable alternative, but it is not our proposal. We do take the "no action" alternative seriously because by law it serves a very important role in helping all of us examine the effects of doing something different. The decision to manage an area for timber is made in the Forest Plan. How and when to manage timber resources in the King George study area is the decision being made by this document. Public comment is very effective in determining the conditions and extent of potential harvest, particularly in the early stages of this project. For example, we have been responsive to public comments (such as the one above) by:

- Determining how the activities proposed in this harvest entry will fit into the entire landscape of North Etolin Island, by conducting a landscape analysis prior to planning this sale
- Using harvest methods, other than clearcut, on the majority of acres treated in each alternative
- Addressing habitat conservation and fishery issues by reducing activities in the King George watershed
- Designing a range of alternatives which are both economical, and responsive to environmental issues

In the section that follows and in the rest of this document we will try and show you exactly how we incorporated public comments into all or at least one alternative. It is difficult to show people we are listening, when comments vary so widely, and almost no

*People told us they were frustrated by public involvement.*

*In this section, we show you how we responded to public comment.*

# 1 - Purpose of and Need for Action

two people agree. Therefore we often present a range of alternatives that reflects the range of public opinion.

**“Public Scoping”** is the term we use to describe the process of finding the significant issues for a project by contacting interested individuals and agencies to determine their concerns. The following is a summary of the letters, contacts and meetings which took place during the planning of this project:

- November, 1993 - Initial “Scoping Letter” and Newspaper Announcements
- September, 1994 - Petersburg and Wrangell, 4 day Open House
- June, 1995 - “Analysis Update” mailer describing Issues and Alternatives
- Proposed Action Published in the Federal Register
- Various meetings with individuals, agencies and organizations including: The Corps of Engineers, Alaska Department of Fish and Game (ADF&G), Alaska Department of Environmental Conservation (ADEC), The Wrangell Resource Council, Wrangell Chamber of Commerce and the Cultural Heritage Committee (IRA).

*Several State and federal agencies are involved.*

**The Importance of Other Agencies-** The Forest Service is responsible for coordinating the review of the project by several other agencies. The purpose of these reviews is often to seek their professional point of view on topics in which they have expertise. In some cases, the reviews are necessary because another agency has authority to issue permits for a specific activity we propose. Below, we have described our relationship to other agencies in the planning of this document.

**US Army Corps of Engineers-** The Corps is responsible for approving actions which propose to dredge or fill materials into the coastal waters of the United States under Section 404 of the Clean Water Act. In this project, we seek a permit from the Corps for the log transfer facility north of Honeymoon Creek. The Corps also has administrative authority over activities associated with wetlands. There are many types of forested and unforested wetlands in the project area including peatlands known as “muskegs.” Any harvest or road construction in these areas is of interest to the Corps, and we must illustrate we have considered and reduced our effects on these areas. All roads proposed by this project are being built for the express purpose of managing the timber resource.

**Environmental Protection Agency-** The EPA provides a general review in accordance with their responsibilities under the National Environmental Policy Act and Section 309 of the Clean Air Act. The EPA is also a reviewer under Section 402 of the Clean Water Act. They also administer the permits for the National Pollution Discharge Elimination System associated with the Log Transfer site.

**US Fish and Wildlife Service-** This agency has authority over threatened and endangered species since they administer the Threatened and Endangered Species Act. Our biologists consult with the service to determine if we are affecting these species. We also discuss effects on other wildlife species with them since they also have expertise in this area. In addition, the Fish and Wildlife Service has collected information on our potential log transfer site and we consult with them during the permit process.

**National Marine Fishery Service-** Has authority for threatened or endangered marine life and we consult with them on possible effects to these species as well as others. We also consult with them on the log transfer site permit.

**State of Alaska-** Five departments in the State of Alaska are asked for their participation in the planning of this project. They supply general comments and suggestions and also

# 1 - Purpose of and Need for Action

specific reviews such as: 1) **Department of Natural Resources**- Tideland Permit and lease of easement necessary for the log transfer site, 2) **Department of Environmental Conservation**- Participates in cooperative water quality management through Section 319 of the Clean Water Act and a Memorandum of Agreement with the Forest Service. ADEC also issues a certificate of compliance with Alaska Water Quality Standards under Section 401 of the Clean Water Act, 3) **Department of Fish and Game**- Are heavily involved in the Coastal Zone Consistency review and take a special interest in fish, water, wildlife and subsistence issues, 4) **Department of Governmental Coordination**- Provides overall coordination for the State's comments and administers the Alaska Coastal Management Program (ACMP) which requires the Forest Service to design their activities to be compatible with approved State management guidelines, 5) **State Historic Preservation Office**- Compliance with Section 106 of the National Historic Preservation Act, a process to determine the effects of alternatives on cultural resources.

## Key Issues

Although there are often many issues surrounding the planning of any timber sale, the law directs us to analyze in detail only those issues which are significant. This helps ensure that this document is concise and focuses on the key issues that those reading it care about. For this project we used an "Initial Scoping" letter to ask individuals and agencies their broad concerns, then after we studied the responses and conducted some analysis, we sent out a second "Project Update" letter to verify the key issues and get some feedback on draft alternatives.

*There are four key issues:*

- *Scenery & Recreation*
- *Economics & Roads*
- *Freshwater Systems*
- *Wildlife Habitat*

As a result of the contacts we made with you, we felt there were **four key issues** of concern; 1) impacts to scenery and recreation opportunities, 2) timber sale economics and road management, 3) impacts to freshwater systems and estuaries and 4) effects on species and habitat conservation. Within each of these issues, there were a wide range of opinions voiced by the public.

For each Key Issue that follows we've included excerpts from actual letters received from you, other concerned citizens, groups and agencies. In the interest of space, we have not included all the comments we received. Instead we wanted to give you some idea of the range of comments we got, representing the many perspectives on a single issue.

## Issue One - Scenic and Recreational Values

*"The viewshed of this study area is seen by virtually all people traveling the inside passage near Wrangell. This includes all the cruise ships and Alaska State ferries which travel along Stikine Strait and Chichagof Pass as well as marine travelers using Zimovia Strait traveling to and from Wrangell."*

*"King George and Honeymoon Cove are very popular recreation sites for local residents and visitors. Beautiful Scenery, nice beaches, proxim(ity) to town, and good hunting and fishing are common to both areas, and King George is the favored take-off point for climbers heading up Mt. Bessie."*

*"We consider the King George area very scenic and spend time there often. The waters near the shore are also among our favorite fishing spots. While we could accept some cuts in this area, logging it all would create an eyesore out of a beautiful place. We believe the scope of logging planned is excessive and does not balance well against the recreational use of the area."*

# 1 - Purpose of and Need for Action

*"Everywhere you see previous clearcuts, the new growth is far healthier and, thus more beautiful."*

*"Please spare us, our children, our neighbors and all visitors to this beautiful areas and log somewhere out of sight of residential areas. I don't think there is a person on this earth who would like to have a logging site take the place of their wilderness, water-front views."*

*"We can see the King George project area from our living room window and to see logging happening there won't hurt our feelings. We note that the southeast corner of Woronkofski was logged some years ago and that it's all grown back quite nicely. Looks good from here."*

*"A very high proportion of the suitable commercial forest land is highly visible from the south end of the City of Wrangell and all along Chichagof Pass and the ferry route on Stikine Strait. Log-transfer sites are typically characterized by sometimes massive, road-cut scars such as at Pat's Creek landing or Olive Cove."*

*"Please log as much as possible - it will provide new, good timber for my grandchildren who will definitely need the work and the wood for homes. Please build as much road as you can so that I will have access to the scenery and wildlife in my declining years. Only lock up the part you think will support you and your family with work."*

*"My family and many others residing in Wrangell are here because of the blessing of safe harbors & the distinct beauty of the close, surrounding mountainsides. This is one of the main reasons we decided on Wrangell as our home. And because the Forest Service has the ability to select (harvest) areas subject to less negative community impact, I feel the King George area would do better to be maintained as it currently is."*

*"It does not bother us how much timber they cut. After 15 years the new growth is up and looks a lot better than the old-growth."*

*"I don't understand why we can't have one...island near Wrangell that is left alone! Why can't you pick on other islands or on the mainland, away from where we have to look at it all the time? I know the scenic considerations don't mean anything to you or the loggers, but they do to us!"*

*"I am in favor of allowing the maximum of logging in the King George area. The roads proposed would open more land for public recreation and the ability for the average family to access this area in terms of hunting, hiking, and just general recreation."*

**What We Heard...** "Beauty is in the eye of the beholder." Whether or not you see the new growth created by harvest as beautiful, most people acknowledge that traditional clearcutting is controversial and ugly, at least for a few years. Thus, partial cutting appeals to some people as one way to have some harvest without the severe visual effects of clearcutting. People care about the views from Stikine Strait, Zimovia Strait and Chichagof Pass because these waterways are common recreational boating lanes for both locals and tourists and the ferries also use these waters. Although not all residents along Zimovia Highway agree, there is concern about the view they will see from their homes. There are also some recreation places that people care about, like views and access to Bessie Peak and dispersed recreation sites near the mouth of Honeymoon and King George Creeks. Although these are the three main recreation sites currently in the project area, if we were to harvest, the development of roads would change the available

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recreation opportunities. Some view roading as opening up areas for walking or hunting and fishing with off-road-vehicles, while some view this increased access as negative because it brings in more people. People have mixed views about keeping roads open to motorized traffic.

## Our Response to What We Heard About Scenery and Recreation Issues...

1) We do not propose clearcutting as the dominant method of harvest. Depending on the alternative, clearcutting accounts for 0% to 27% of the acres harvested. Although some alternatives will have more visual impacts than others, all alternatives designed units to be as unobtrusive and natural looking as possible.

2) We designed the log transfer site to be unobtrusive by having only the minimum facilities necessary on the beach. Cutting into the bank was minimized and a low angle ramp is proposed because it is more flexible to a variety of operators and is less visually obtrusive. The log transfer site is about 1/3 the size of Pat's or Earl West Cove LTF's by comparison.

3) There is no harvest immediately adjacent to the mouth of King George Creek or Honeymoon Creek. We propose that the bulk of old-growth reserve areas be placed in the King George Creek area because it will do wildlife and people the most good there. Thus, there is little if any effect to the King George recreation place in any of the alternatives.

4) We provided a range of management options for roads which varies from keeping them open to both motorized and non-motorized travel OR to maintain some of them as trails for walk-in or bike in access.

5) Our proposals protect the ability of hikers to use the ridge line corridor to access Bessie Peak with minimal harvest and tried to design any units in the interior of the valleys to blend into terrain features or appear like some of the existing slides.

In addition, we designed each of the alternatives to respond to the possible impacts on scenery and recreation in different ways. To help you see the key differences between the alternatives we will:

- Include drawings of the King George area the way it would likely appear from the Zimovia and Stikine Strait waterways.
- Show the acres of different harvest prescriptions used that will be seen from each vantage point and discuss the potential success and impact of these methods to reduce visual impacts.
- Describe the impacts of the proposed log transfer site by using other sites in the area (Pat Creek and Earl West Cove) as a basis of comparison.
- Describe any shifts in recreational opportunities or experiences that will occur in the project area due to harvest and road construction and management. We will describe how these changes may affect certain user groups negatively or positively.

*Scenery issues are dealt with by:*

- *avoiding harvest in a viewshed, and*
- *using partial cuts*

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## Issue Two - Timber Sale Economics and Road Management

*"My first concern deals with providing an economical timber harvest. In order to do this units must have adequate volumes of good timber and sound logging costs. Helicopter logging should be used sparingly and only when absolutely necessary."*

*"30 MMBF seems like an extremely high volume sale for an area this small and hilly."*

*"I do not buy into the local jobs point of view especially when the local saw mill and pulp mill are not locally owned."*

*"Opportunity should be explored to reduce road standards when possible. Alternatives should explore road building activities which will reduce costs, meet use objectives and protect resources."*

*"Over the last 24 hours I have watched three tugs tow log rafts south out of Anita Bay past Thoms Place toward Clarence Strait and Ketchikan. Not even the tugs were Wrangell-based. ...the real economic gains to be made from harvesting timber in this area just a few miles from Wrangell will be lost to this community. This sale should not be characterized as being of economic benefit to Wrangell when the likelihood is that it will be left with 1,200 acres of harvested forest on its front doorstep and very little else to show for it."*

*"Also, if there is a sale, that it is small enough and laid out such that small logging operators can bid on it and it's not another gravy ride for Ketchikan Pulp."*

*"Considering the shortage of economically-harvestable wood available to the timber industry, the plan should include one alternative that is the maximum-allowable cut legally permissible. Other alternatives should heavily consider economics and produce timber sales that make economic sense."*

*"We're not too crazy about helicopter logging. They seem to hire more out of State help and we would like to see Alaska jobs go to Alaskans. We don't see any Alaska-based helicopter companies."*

*"I think it would be OK to leave the roads open after logging as they will never be tied to any mainline systems."*

**What We Heard...** The harvest, transportation, and production of timber have been important components of the economies in Southeastern Alaska for decades. Long-term contracts between the U.S. Government and timber industries stimulated these economies by sustaining certain levels of timber harvest each year. In recent years, one of these contracts was canceled and some towns are experiencing declines in timber-related revenues. Our public scoping identified significant concerns about the availability of timber—both for large and small operators—in the future and about the rising costs associated with logging. Some frankly don't see the local benefit of harvesting timber, now that the mill has shut down. Also of concern to some is whether the timber from this sale would be offered to long-term contract purchasers or to independent purchasers. There are many factors that drive up the cost of harvesting timber in Southeast Alaska; road building (often on soft muskeg soils), quality of the timber cut and yarding method (helicopter is the most expensive, cable is the least).

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## Our Response to What We Heard About Economic and Supply Issues...

1) In each alternative we tried to reduce the costs while still exploring the possible environmental advantages. All but one alternative is “in the black” according to our mid-market assessment. Temporary roads are used in areas where the road will not be needed in the future.

*All alternatives are as cost effective as possible.*

2) We have used harvest methods other than clearcutting to balance the increased cost of helicopter yarding and increase economic revenues when possible. This is achievable when the trees left for wildlife or scenic resource reasons are not the same trees that are best for timber or the most economical to harvest. We also propose to leave good quality seed trees and younger trees in harvest units to help regenerate a healthy mix of trees.

*A mix of small and large sales is considered.*

3) Each alternative has some units that can be easily logged by both small and large operators. This affords us the flexibility to offer one or several sales from this environmental document. Even though the decision to harvest timber is being made under this document, it will not address who specifically gets the timber (only the environmental effects). We have heard your concerns and will disclose the amount of volume and units that have the **potential** to be offered to small operators.

*A variety of road management options are provided.*

4) The log transfer site design was kept as small and as cost effective as possible. We propose a ramp, instead of a bulkhead so that it can be used by a variety of small and larger operators.

5) We provided a range of management options for future road management to reduce maintenance costs.

The alternatives vary widely in their effect on economics and supply issues. In order to understand the effects of each alternative, we will:

- Explain the regional and local economic benefits of the sale and each alternative.
- Estimate the volume to be harvested by alternative.
- Display harvest costs and selling values for each alternative.
- Identify the harvest units, acreage and volume of those areas that have the potential to be harvested by small operators because they are close to a road or would not require special equipment.
- Show the relative costs and benefits associated with keeping open portions of any road system constructed.

## Issue Three - Freshwater Systems and Estuaries

*“I am also worried about the effects logging may have on fishing in the area especially the King George drainage. As it stands this is one of Wrangell's most productive areas for sport fishing.”*

*“We are concerned that a sale of this size in two small watersheds will have serious impacts on fish...populations.”*

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*"The material along Honeymoon Creek should be left for 200 feet, as salmon and trout are in this creek...I haven't been around to King George Creek in over 30 years, but I would assume fish are in that creek also, and should be protected, too."*

*"All culverts and bridges should be removed at the end of the sale and all roads grass seeded. Harvest as many units as possible with helicopters to reduce the need for roads, particularly in the steeper slopes of King George."*

*"I am a commercial crab operator. Honeymoon Creek has very good crab habitat. I'm afraid that the location of your LTF would put this in jeopardy."*

*"Wetland mapping will need to be included with the DEIS to support wetland avoidance/minimization requirements. There will need to be a discussion on how road construction will be designed to meet Best Management Practices (BMP's)."*

*"In addition to assuring full protection of fish habitat when designing stream buffers, the Forest Service needs to avoid, to the maximum extent practicable, the highest value wildlife habitat in the 100-300 foot riparian zone."*

*"Much of the area appears to be steep. An issue would be whether harvest occurs on high hazard soils or over-steepened slopes. Timber on slopes of over 75% should not be harvested and should not be included in the timber base."*

**What We Heard...** This issue centers on concerns about how timber harvest, road construction and log transfer site activities will affect the quality of the freshwater systems and the fish and wildlife that use them in the area. Freshwater systems include anadromous and resident fish streams and their tributaries, their riparian areas, floodplains, wetlands, and estuaries. Commercial and sport fishermen, in particular, care about keeping fishing streams healthy and productive. Roads and timber harvest produce sediment which may threaten this productivity. Other agencies such as the Corps of Engineers, the Environmental Protection Agency and the State of Alaska have particular interest in this issue since they have authority of the management in and around streams, tidelands, estuaries and wetlands. They often have very specific information needs relative to each proposed unit, road and alternative.

## **Our Response to What We Heard About Freshwater and Estuary Issues...**

*Inventories identified all fish streams near disturbance areas to protect them with at least 100 foot buffers.*

- 1) We completed extensive inventory of streams and field verified all potential areas of disturbance. Streams in the project area were surveyed and flagged to verify and mark the extent of fish habitat. Unit and road cards show most of the streams we are likely to affect.
- 2) The Tongass Timber Reform Act 100 foot minimum buffers have been identified in the field and are key to helping protect fish habitat values in the project area. In some cases the buffers exceed 100 feet to provide logical unit boundaries. We located roads as far away from streams as practical while still meeting timber access objectives.
- 3) Estuary and beach buffers protect important estuaries where freshwater meets saltwater in all alternatives. Logical field verified unit boundaries and road locations resulted in buffers which meet or exceed Forest Plan guidelines.
- 4) Most of the old growth habitat retention is located in the King George drainage, thus helping protect the highest quality anadromous fish habitat in the study area. The proposed log transfer site was located on the Honeymoon Creek side. We rejected several

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potential locations on the King George side because the LTF's and associated roads would have more environmental impact to marine life, fish and wildlife. The LTF and sort yard design minimize bare ground and reduce the potential for sediment transport to fresh and marine waters.

5) We avoided wetland impacts where practicable while still providing access to timber. Proposed harvest and roads incorporate site-specific measures to maintain wetland soil/water/vegetation functions. These are described in unit and road cards in the appendix.

*Wetland and estuary functions are maintained.*

6) We considered road maintenance concerns when we explored various road management options. Some roads involve greater risks to water quality and this became an important criteria for managing roads in the future.

7) Proposed harvest is minimized on over-steepened slopes having a high probability of mass wasting. We field verified areas to ensure that the units were not on oversteepened slopes, and made necessary boundary adjustments. Selective harvest will help maintain rooting strength contributing to slope stability. Helicopter and skyline cable systems will also help minimize soil disturbance.

*Selective harvest helps maintain slope stability.*

8) Bridge and culvert surveys on critical streams identified design measures to help ensure debris and flood passage. Some structures are purposely oversized to reduce maintenance costs and water quality risks. We used stream channel stability as a primary criterion for stream crossing location. Some proposed crossing sites on King George Creek were discarded because they did not meet this criteria.

*Road crossings were carefully selected.*

9) Proposed harvest adjacent to streamside buffers often retains 30-50% of the trees in harvest units to help maintain habitat characteristics within riparian corridors and windfirm buffers.

We have provided a range of alternatives that varies the effects on the freshwater system. We have also taken into account the information needs of other cooperating agencies and will present the following information about each alternative:

- We will show the various components of the freshwater system including fish streams and their tributaries, floodplains and riparian areas, sensitive watersheds, upland sediment sources and wetlands including estuaries. Each component will be described in terms of its ecological role.
- We will display wetlands (including estuaries) and the direct and indirect impacts of proposed roads and units. Our analysis will discuss the role of wetlands in ecosystems and address any impacts resulting from proposed activities. The acres of wetland affected will be used as an indicator.
- An interagency site evaluation will address the potential effects of the LTF.
- We will show all inventoried fish streams. Risk to fish will be evaluated using length of road, number of stream crossings, acres of harvest and proximity of harvest to streams as indicators.
- We will describe the relative sensitivity of watersheds in the project area and indicate possible harvest thresholds.

*A log transfer facility evaluation is located in Appendix D.*

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- We will address the relative risks of sedimentation based on site investigation of road and unit location.
- The Unit and Road Cards we display in the Appendix of this document show more detail about the streams and wetlands affected and the specific protection measures used, including Best Management Practices (BMP's).

## Issue Four - Habitat Conservation

*"The diverse wildlife populations including black bear, deer, elk, moose, as well as fur bearers such as mink and marten will likely be reduced due to timber harvest and the proposed road system."*

*"Goshawks, bears, wolves, moose, elk, deer, sea lions, etc. The cumulative impact on these and other wildlife species during and after the roading and cutting will result in population stresses from a variety of causes."*

*"This is the last large unfragmented area on N. Etolin and wildlife populations are effectively isolated from habitat on S. Etolin as the narrow corridor connecting north and south is severely fragmented by timber harvest, roading, and an active logging camp."*

*"I am also concerned about the effects on...wildlife from a timber sale of this size. Both Honeymoon and King George are relatively small watersheds. However, this is the last large area on Etolin Island which has not been broken up by timber cutting."*

*"The...Honeymoon Creek area (is) heavily used by winter birds—loons, Western grebes, varieties of gulls, all-year resident Canada geese, common and Barrow's goldeneyes, buffleheads, mergansers, trumpeter swans, and others. I believe having a log transfer facility at Honeymoon will very-negatively impact all these bird populations, not to mention the other wildlife in the area."*

*"I am concerned about the proposed timber sale units and proposed LTFs on North Etolin, aka. King George. Waterfowl, sea life, and scenery will be permanently damaged if any of this proposed sale is carried through."*

**What We Heard...** Species conservation concerns include impacts to the natural plant and animal habitat diversity at various scales (i.e., individual stand, King George study area, and Etolin Island). Of particular concern are impacts to unique habitats; and threatened, endangered, or sensitive species such as the goshawk. Some wildlife species require relatively large areas of late-successional, old-growth forests. When trees are cut, this habitat may be altered. When very few trees are cut across a given area, there may be very little or no changes in the quantity or quality of old-growth habitat but, when most or all of the trees are cut in blocks across an area this may make the entire area unsuitable for some species. This is called *fragmentation*, and is another concern to the public and other agencies. We also heard concerns about harvesting specific areas such as the higher volume stands in the study area.

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## Our Response to What We Heard About Species Conservation Issues...

1) We made considerable effort to examine the relationship of the King George study area to the rest of Etolin Island and are proposing to locate most harvest activities outside two of the most important conservation and corridor areas; lower King George Creek and the Red Mountain face area. The Kunk Lake saddle, Fishtrap Creek and the riparian corridors may also be important to the movement of wildlife. If an alternative proposes harvest in these areas we can reduce the effects through road management or the type of selective harvest we use.

*Appendix A summarizes the relationship of the King George area to the rest of Etolin Island.*

2) Critical habitat “hot spots” include the King George estuary, riparian areas, southfacing slopes (for ungulate thermal values) and stands in the Honeymoon drainage with large trees. Some alternatives can avoid these areas entirely, while others modify harvest and roading to reduce the impact on these areas. For example, all alternatives avoid the King George estuary and the adjacent south facing slopes. Most alternatives harvest some south-facing areas, but long, thin units help maintain travel corridors. We also have concentrated proposed harvest on the less valuable thermal cover on north-facing slopes near King George Creek and on the Chichagof Face.

*Critical areas are avoided or mitigated.*

3) We propose the use of partial cutting to leave various amounts of trees in harvest units. The trees left provide structural diversity in forests over time which can retain the value of the area for some wildlife species. The entire Chichagof Face is proposed for small group or patch cut harvest. Because such methods are experimental in Southeast Alaska, we would monitor and adapt their use over time.

*Partial cutting may reduce fragmentation and provide more diversity.*

4) Under all alternatives, we want to maintain at least 50% of each land unit in an old growth or mature condition over time. To do this, we would have to harvest considerably less than this in some areas now, if we expect to harvest over time (ie. not take all the commercial timber now, and sustain a level of harvest over time). Many of the sub-areas, have more unsuitable than suitable lands for timber production. Thus, almost 2/3 of the entire study area will be forested old-growth over time, and several of the land units will have 60% or more forest in a mature or old growth condition.

5) Some roads, particularly in the King George Creek area, may be closed to motorized access after harvest to reduce possible effects on wildlife by people. Alternatives that propose heavier amounts of harvest in some land units may also close roads, if there is not a need for the road for some time.

*Some roads may be closed to motorized vehicles after harvest.*

6) We conducted field surveys for marbled murrelets and goshawks. We did not find any nests during the surveys, but later we found evidence that goshawks may nest in the area.

We have also provided a range of alternatives that varies the effects on species conservation issues and will present the following information about each alternative:

- We will describe the effects on specific species that require old-growth forest conditions for all or part of their habitat needs. We'll also measure the current level of fragmentation on Etolin Island and the study area and describe the potential changes by alternative.
- Harvest will not affect currently listed Threatened or Endangered Species, but there are concerns for sensitive or special interest species such as the goshawk or marbled murrelet. We will reveal the methods and results of our inventories and disclose the effects of each alternative.

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*Old growth areas to be retained are designated primarily in the King George watershed.*

- The current Tongass Land Management Plan requires us to set aside a percentage of old-growth. We will briefly discuss our method of selection, location and acres of retained old growth areas.
- We will describe the corridors that allow the movement of wildlife across landscapes and disclose our effects on them.
- Within each forest stand there are different sizes of trees, canopy levels, mixes of species and amounts of decaying logs and trees. This diversity is an important part of forest communities and habitats. By using selective harvest methods, we can retain some of this diversity over time, while still harvesting and growing timber for people's use and jobs. We will show the number of acres of each type of harvest method.
- In addition to freshwater systems and estuaries, we will evaluate the effects on the beaver pond and wetland area at the head of King George Creek and a high-volume stand of spruce, hemlock, and cedar near Honeymoon Creek. We also disclose the amount of harvest in each volume class by alternative.

## Other Environmental Considerations

There are often minor issues we must disclose by law or that are brought up by the public. Although they were considered in our analysis, we won't spend a lot of time discussing these issues because this document is thick enough as it is, and we want to spend the bulk of the analysis on major issues. Other issues we will have minor effects on and briefly describe include:

- *Subsistence*
- *Cultural and Archeological Resources*
- *Soil and Vegetative Productivity*
- *Air Quality*
- *Effects on Consumers, Civil Rights, and Women*

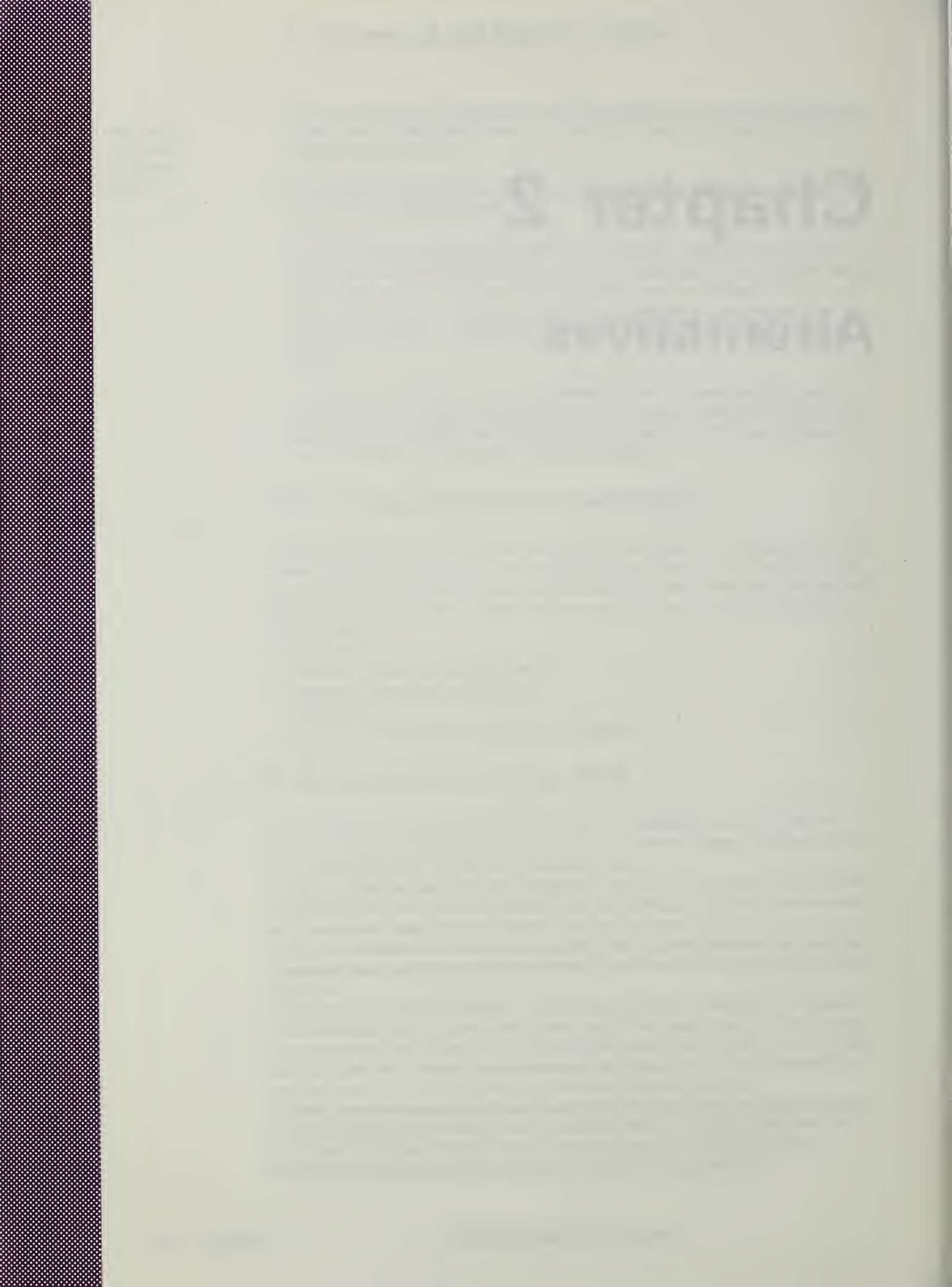
## Public Comment on the DEIS

Several changes were made in the preferred alternative (Alternative 5) as a result of public and other agency comment on the Draft Environmental Impact Statement which was published in April. Briefly, the changes included:

- 1) The road segment into Unit 18 was dropped. Unit 18 is now proposed for helicopter yarding to retain more small trees within the harvested areas. This change was made to address concerns about sediment from the road and unit going into King George Creek.
- 2) The road segment into Unit 22 was dropped. Unit 22 is now proposed for helicopter yarding to retain more small trees within the harvested area for the same benefits as Unit 18 above.
- 3) The area encompassing Units 10, 11 and 12 which lie partly within the lower edge of the Honeymoon Creek Volume Class 7 stand, will be harvested using group /individual tree selection or patch cutting. This will address the values of this stand, provide a source for high value wood products while minimizing the fragmentation of the Volume Class 7 stand by harvesting below the road using uneven-aged harvest methods.
- 4) Road management strategies were changed or clarified to address water quality issues related to our ability to maintain culverts and other structures across streams over time.
- 5) Zimovia Face harvest Units 3, 4 and 30 were designed to be harvested with a helicopter and therefore making a road across Zimovia Face unnecessary.

# Chapter 2

## Alternatives



# Chapter 2

## Alternatives

### Introduction

In this chapter we describe the process we used to develop alternatives to the Proposed Action. We describe the alternatives we are studying in detail, summarize those alternatives we dropped, identify mitigation measures, and briefly compare the alternatives. We also identify a preferred alternative which is Alternative 5 with some considerations for scenery and harvest of small sales over time (see page 2-20).

### Alternative Development

The Proposed Action is only one approach to harvesting timber in the King George area. This chapter describes five other alternatives being considered. These other alternatives were developed to fulfill the **Purpose and Need for Action** and to respond to the **Key Issues** that were identified during our public involvement process. All of the alternatives were designed to address all of the Key Issues to some degree (see summary of the desired condition analysis in Appendix A). However, each alternative does ‘solve’ the Key Issues in different ways or to a greater extent than others. Again, the Key Issues are:

*Alternatives are developed in response to four key issues.*

1. *Scenic and Recreation Values*
2. *Timber Sale Economics and Road Management*
3. *Freshwater Systems and Estuaries*
4. *Habitat Conservation*

**Road Management Under the Alternatives-** Managing roads for the future is a complex issue and must consider trade-offs between offering motorized access to the public; the cost of maintenance; the need to retain some areas as walk-in areas for both recreation, hunting, and wildlife habitat; and the need for roads in potential future harvest operations. The various alternatives propose different approaches to road management consistent with each alternative's theme or emphasis.

### Alternatives Considered in Detail

#### Proposed Action (Alternative 5)

The ‘Proposed Action’ proposes the highest level of harvest that could occur in the King George Study Area while still meeting our management direction and desired future conditions. We will describe it first here, so that it is the basis of comparison for the other alternatives. Table 2-1 and Figure 2-1 display the specific activities. The Proposed Action would harvest approximately 26.8 MMBF of timber from about 1,393 acres.

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*Alternative 5 harvests the most timber while responding to scenery, freshwater, and habitat issues.*

Approximately 10.8 miles of road would be constructed beyond an LTF just north of Honeymoon Creek. The Proposed Action would offer the most volume to potential large and small operators in the next five years, but little would be left for re-entry over the next 50 years (only about 4 MMBF). Approximately 124 acres would be suitable for small operators, which would provide the highest level over the next 5-year period, but little would remain to log over time. The most initial roading is also proposed. Roads west of the crossing on King George Creek would be closed to motorized vehicle access.

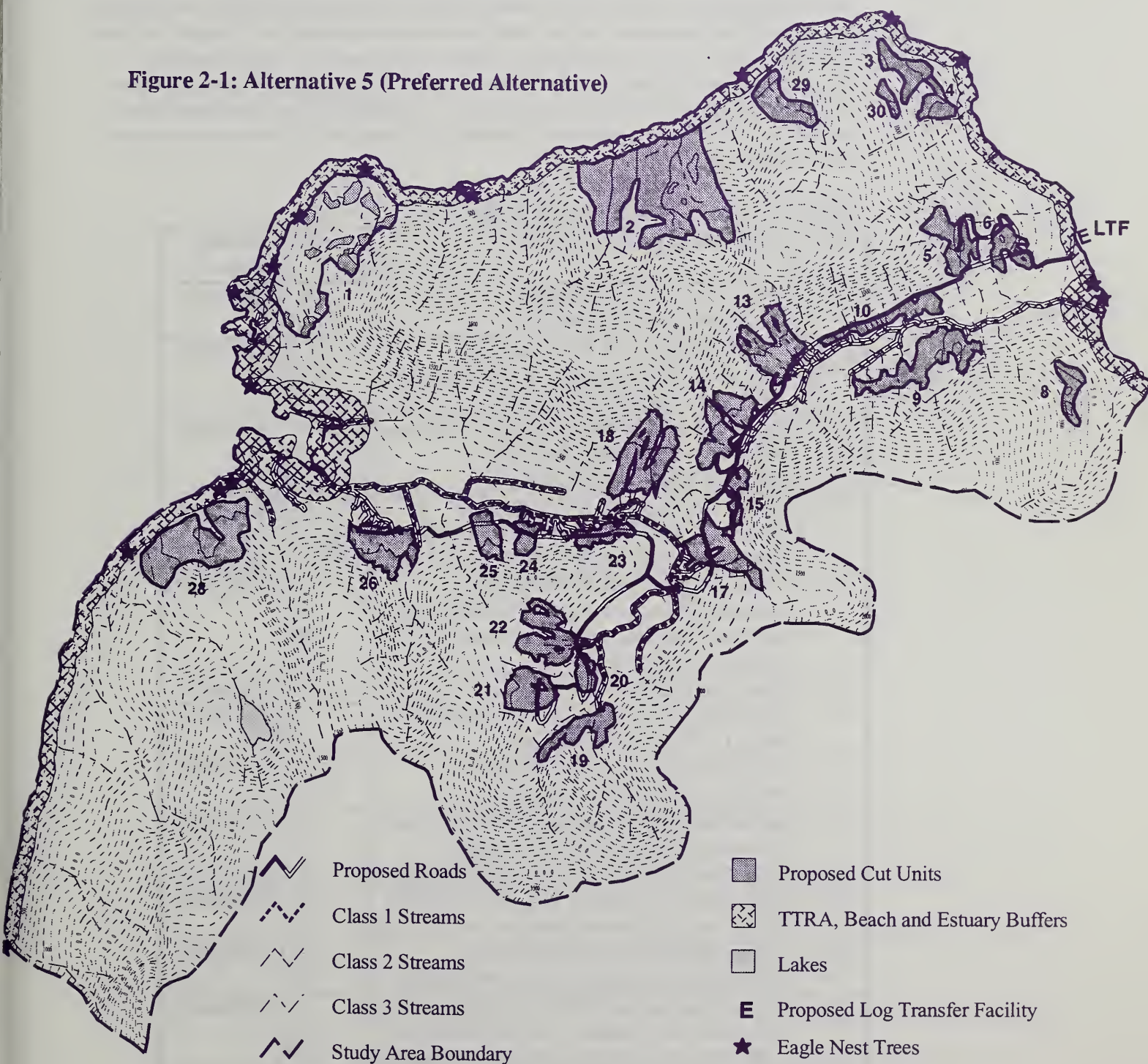
**Table 2-1, Proposed Harvest Units in Alternative 5**

Unit	Silvicultural Harvest Method	Acres	Yarding Method
1	Patch Cuts with 10% Retention	46	Helicopter
	Patch Cuts with 30% Retention	24	
2	Group Selection with 70% Retention	131	Helicopter
	Individual Tree Selection with 50% Retention	159	
	Patch Cut with Seedtree Residuals	7	
3	Individual Tree Selection w/ 50% Retention	24	Helicopter
	Patchcut with Seedtree Residuals	2	
	Overstory Removal with 10% Retention	8	
4	Group Selection with 70% Retention	10	Helicopter
	Individual Tree Selection with 50% Retention	5	
	Overstory Removal with 10% Retention	9	
5	Individual Tree Selection with 30% Retention	20	Cable, Helicopter Skyline
	Individual Tree Selection with 50% Retention	20	
	Overstory Removal with 10% Retention	11	
6	Clearcut with 10% Retention	29	Cable or Shovel
	Individual Tree Selection with 50% Retention	3	
8	Group Selection with 70% Retention	15	Helicopter
	Patch Cut with Seedtree Residuals	11	
9	Individual Tree Selection with 50% Retention	5	Helicopter
	Overstory Removal with 30% Retention	71	
10	Individual Tree Selection with 50% Retention	30	Cable
13	Clearcut with 10% Retention	30	Cable
	Overstory Removal with 10% Retention	27	Helicopter
14	Clearcut with 10% Retention	33	Cable
	Overstory Removal with 10% Retention	22	Helicopter
15	Individual Tree Selection with 30% Retention	14	Cable
17	Clearcut with 10% Retention	35	Cable
	Individual Tree Selection with 30% Retention	22	Helicopter
18	Individual Tree Selection with 50% Retention	28	Helicopter
	Overstory Removal with 30% Retention	70	
19	Individual Tree Selection with 50% Retention	36	Helicopter
20	Clearcut with 10% Retention	16	Cable
21	Clearcut with 10% Retention	36	Cable
22	Overstory Removal with 10 % Retention	61	Helicopter
23	Individual Tree Selection with 30% Retention	19	Cable
24	Individual Tree Selection with 30% Retention	11	Cable
25	Individual Tree Selection with 30% Retention	23	Cable
	Overstory Removal with 30% Retention	9	Helicopter
26	Individual Tree Selection with 30% Retention	41	Cable
	Individual Tree Selection with 50% Retention	20	Helicopter

## 2 - Alternatives

28	Group Selection with 70% Retention	77	Helicopter
	Individual Tree Selection with 30% Retention	13	
	Individual Tree Selection with 50% Retention	49	
29	Individual Tree Selection with 50% Retention	36	Helicopter
	Patch Cut with 30% Retention	13	
30	Individual Tree Selection with 50% Retention	3	Helicopter
	Patch Cut with Seedtree Residuals	1	
	Patch Cut with 30% Retention	6	

Figure 2-1: Alternative 5 (Preferred Alternative)



## 2 - Alternatives

### Alternative 1

*Alternative 1 proposes harvest within one mile of saltwater, no roads, and helicopter logging.*

Alternative 1 responds primarily to public concerns surrounding economic return, freshwater systems and habitat conservation (Issues 2,3 and 4). Fragmentation would be reduced in the interior portions of the study area by dropping units 11—26 along Honeymoon and King George Creeks. Since both Creeks are Class I, anadromous streams, dropping these harvest units would also minimize impacts to those freshwater systems. Alternative 1 would leave the most volume available (about 16 MMBF) for potential future harvest entries, but roads would have to be constructed to remove it. Helicopters would be used to yard and transport the trees to the water rather than trucks, so no Log Transfer Facility (LTF) or roads would be constructed this entry. No clearcuts are proposed in Alternative 1 which would harvest approximately 14.1 MMBF of timber from about 888 acres. This alternative would be least attractive to small operators because few can afford the cost of helicopter logging. Table 2-2 and Figure 2-2 display the specific activities involved in Alternative 1. An asterisk (\*) has been placed next to the units whose design and methods of harvest in Alternative 1 differ from those shown for the Proposed Action.

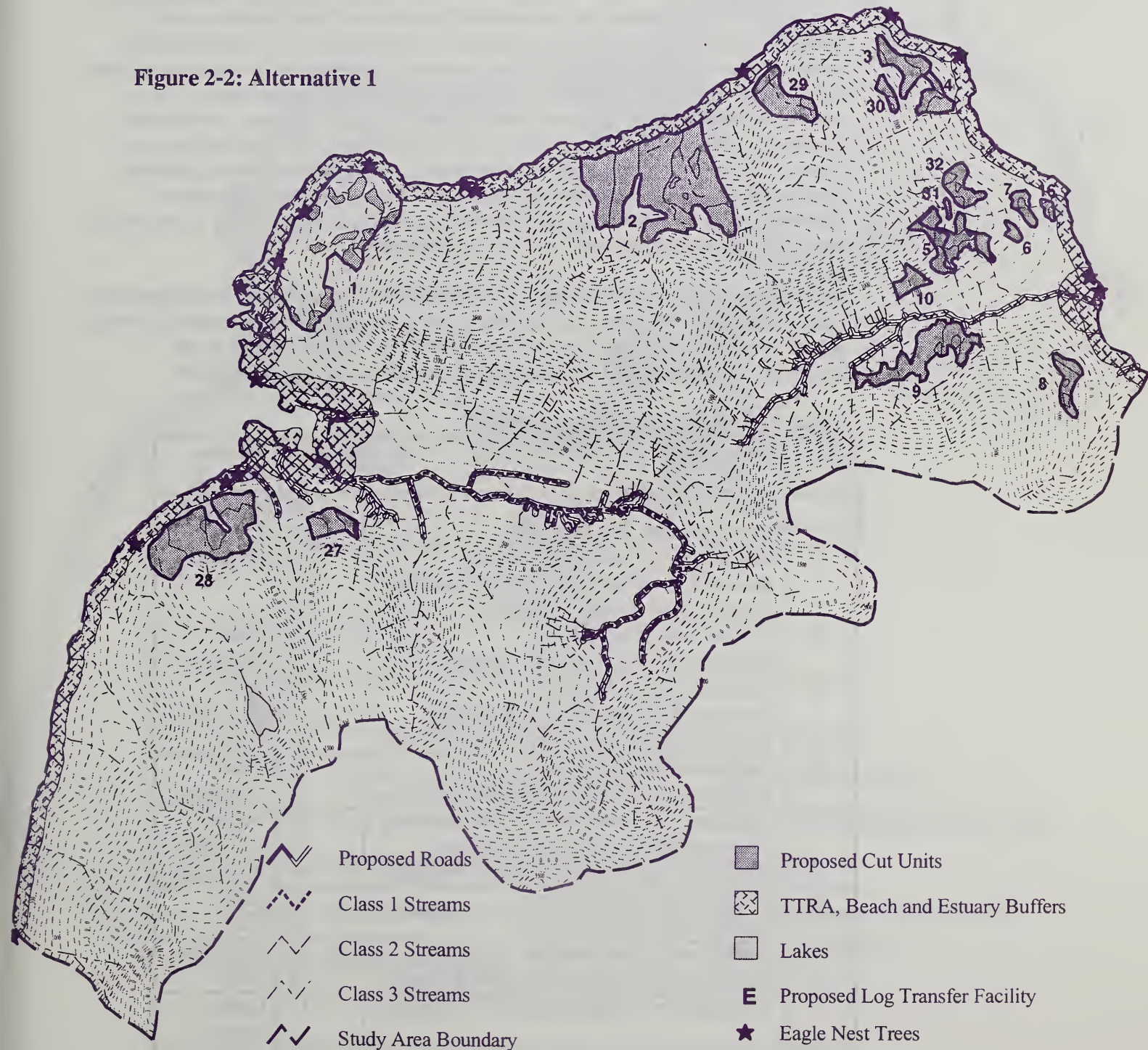
**Table 2-2, Alternative 1 Harvest Units**

Unit	Silvicultural Harvest Method	Acres	Yarding Method
1	Patch Cuts with 10% Retention	46	Helicopter
	Patch Cuts with 30% Retention	24	
2	Group Selection with 70% Retention	131	Helicopter
	Individual Tree Selection with 50% Retention	159	
	Patch Cut with Seedtree Residuals	7	
3	Individual Tree Selection with 50% Retention	24	Helicopter
	Patch Cut with Seedtree Residuals	2	
	Patch Cut with 10% Retention	8	
4	Group Selection with 70% Retention	10	Helicopter
	Individual Tree Selection with 50% Retention	5	
	Overstory Removal with 10% Retention	9	
5*	Group Selection with 70% Retention	16	Helicopter
	Individual Tree Selection with 50% Retention	14	
	Overstory Removal with 10% Retention	29	
	Patch Cut with 10% Retention	5	
6*	Patch Cut with 10% Retention	6	Helicopter
7*	Individual Tree Selection with 50% Retention	7	Helicopter
	Patch Cut with 10% Retention	7	
8	Group Selection with 70% Retention	15	Helicopter
	Patch Cut with Seedtree Residuals	11	
9	Individual Tree Selection with 50% Retention	5	Helicopter
	Overstory Removal with 30% Retention	71	
10*	Individual Tree Selection with 30% Retention	16	Helicopter
16*	Individual Tree Selection with 50% Retention	3	Helicopter
	Patch Cut with Seedtree Residuals	2	
27*	Group Selection with 70% Retention	12	Helicopter
	Individual Tree Selection with 50% Retention	17	
28	Group Selection with 70% Retention	77	Helicopter
	Individual Tree Selection with 30% Retention	13	
	Individual Tree Selection with 50% Retention	49	

## 2 - Alternatives

29	Individual Tree Selection with 50% Retention Patch Cut with 30% Retention	36 13	Helicopter
30	Individual Tree Selection with 50% Retention Patch Cut with Seedtree Residuals Patch Cut with 30% Retention	3 1 6	Helicopter
31*	Patch Cut with Seedtree Residuals	2	Helicopter
32*	Individual Tree Selection with 50% Retention Patch Cut with Seedtree Residuals	19 7	Helicopter

Figure 2-2: Alternative 1



## 2 - Alternatives

### Alternative 2

*Alternative 2 harvests timber in the interior of the area, at the heads of watersheds. A road on the south side of Honeymoon Creek would be built.*

Alternative 2 responds primarily to public concerns about scenery, roaded recreation, freshwater systems, and habitat conservation issues (Key Issues 1, 3, and 4). This alternative would reduce the visibility of harvest activities from Stikine Strait, Chichagof Pass, Zimovia Strait, and Zimovia Highway on Wrangell Island by dropping units 3—12, 27, and 28 from harvest. Harvest activities would be concentrated primarily within the interior portions of the project area and on slopes facing Chichagof Pass. Fragmentation would be minimized in the outer, saltwater-facing portions of the east side of the study area. This alternative harvests timber at the head of the freshwater systems and, in response to public concerns over fragmentation of the large stand in Honeymoon Creek, considers a road location on the south side of Honeymoon Creek (all other roaded alternatives propose this road on the north side). Approximately 10.8 miles of roads would be constructed into the Honeymoon and King George watersheds originating from an LTF north of Honeymoon Creek. About 10 MMBF might be available for future entries and about 60 acres of harvest would be suited to small operators. Alternative 2 proposes 239 acres of clearcuts (25% of the acres proposed for harvest) and produces about 19.5 MMBF of timber from about 968 acres. Several units harvested under the Proposed Action are not harvested in Alternative 2, but all units proposed under Alternative 2 are the same design as shown in the Proposed Action. Table 2-3 and Figure 2-3 display the specific activities involved in Alternative 2.

**Road Management:** Approximately 5 years after harvest operations are completed, only those roads west of the King George Creek crossing would be closed to motorized vehicle access. Walk-in or non-motorized access would be welcome. The roads in the Honeymoon drainage would remain open and maintained for motorized access.

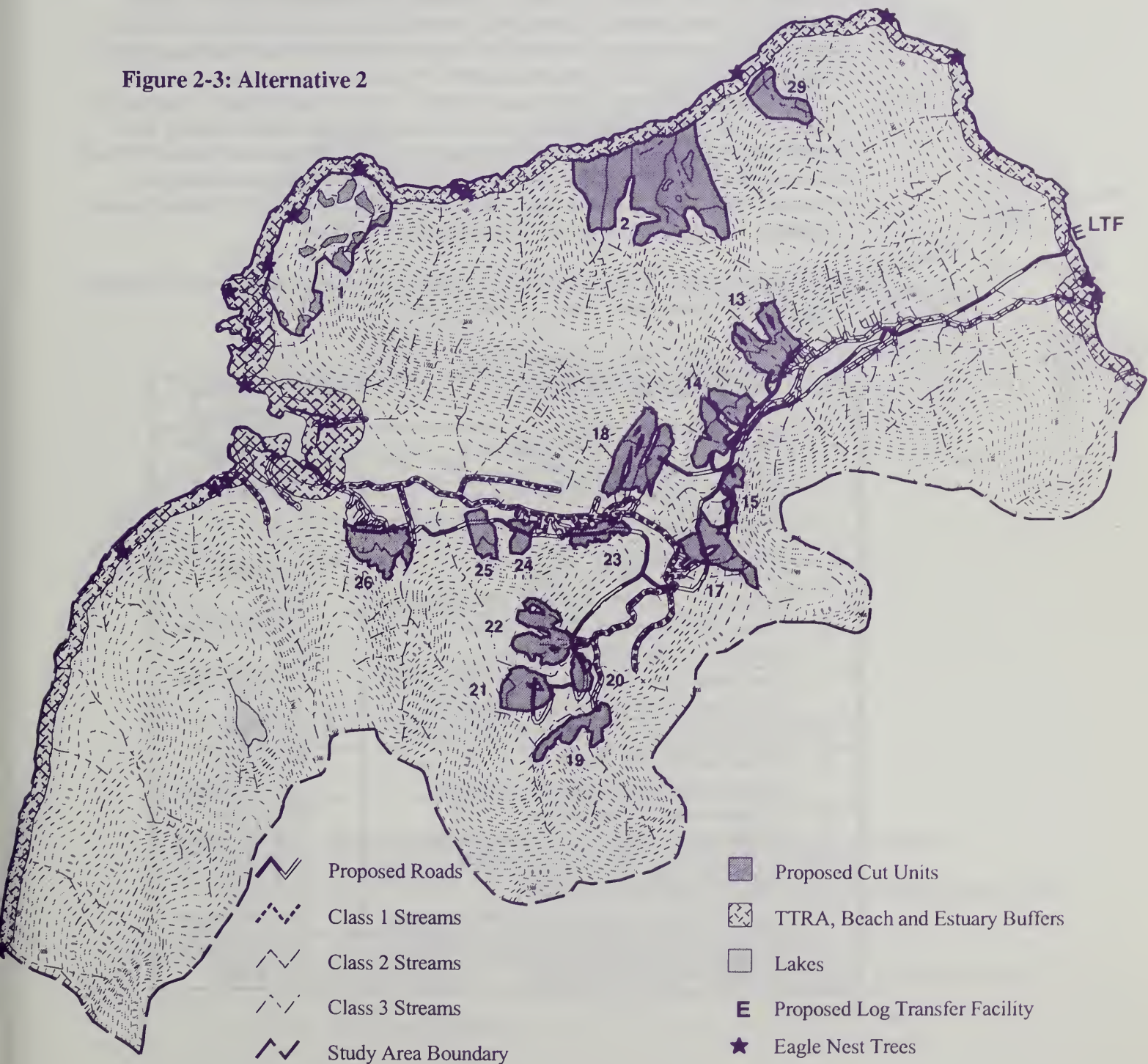
**Table 2-3, Alternative 2 Harvest Units**

Unit	Silvicultural Harvest Method	Acres	Yarding Method
1	Patch Cuts with 10% Retention	46	Helicopter
	Patch Cuts with 30% Retention	24	
2	Group Selection with 70% Retention	131	Helicopter
	Individual Tree Selection with 50% Retention	159	
	Patch Cut with Seedtree Residuals	7	
13	Clearcut with 10% Retention	30	Cable Helicopter
	Overstory Removal with 10% Retention	27	
14	Clearcut with 10% Retention	33	Cable Helicopter
	Overstory Removal with 10% Retention	22	
15	Individual Tree Selection with 30% Retention	14	Cable
17	Clearcut with 10% Retention	35	Cable Helicopter
	Individual Tree Selection with 30% Retention	22	
18	Individual Tree Selection with 50% Retention	28	Skyline Helicopter
	Overstory Removal with 30% Retention	70	
19	Individual Tree Selection with 50% Retention	36	Helicopter
20	Clearcut with 10% Retention	16	Cable
21	Clearcut with 10% Retention	36	Cable
22	Clearcut with 10% Retention	61	Helicopter
23	Individual Tree Selection with 30% Retention	19	Cable
24	Individual Tree Selection with 30% Retention	11	Cable or Shovel
25	Individual Tree Selection with 30% Retention	23	Cable &

## 2 - Alternatives

	Overstory Removal with 30% Retention	9	Helicopter
26	Individual Tree Selection with 30% Retention	41	Cable &
	Individual Tree Selection with 50% Retention	20	Helicopter
29	Individual Tree Selection with 50% Retention	36	Helicopter
	Patch Cut with 30% Retention	13	

Figure 2-3: Alternative 2



## 2 - Alternatives

### Alternative 3

*Alternative 3 avoids harvest in the lower King George watershed.*

Alternative 3 emphasizes roaded recreation, scenic values, economic return, and freshwater systems (Key Issues 1, 2, and 3). Potential visual impacts from the ferry routes would be minimized by dropping units 3, 4, 25, 26, and 28. Dropping units 5, 10, 18, and 23-28 along Honeymoon and King George Creeks would reduce impacts to those freshwater systems. Approximately 7.7 miles of road would be constructed. There would be no harvest in the Lower King George watershed thus reducing effects to fisheries, wildlife, and scenic qualities. Alternative 3 would leave the most volume available for future entries that would be accessible from roads constructed this entry. About 75 acres would be suitable for small operators this entry. As in the Proposed Action, an LTF would be constructed north of Honeymoon Creek. Table 2-4 and Figure 2-4 outline the specific harvest activities for Alternative 3, which would harvest approximately 16.7 MMBF from about 894 acres. Alternative 3 would involve 240 acres of clearcut (27% of the acres proposed for harvest). Several units where harvest is proposed under the Proposed Action would not be harvested in this alternative, but all units proposed under Alternative 3 are the same as displayed for the Proposed Action.

**Road Management:** Under this alternative, most roads would remain open to motorized access (except for temporary roads and the road past Unit 20).

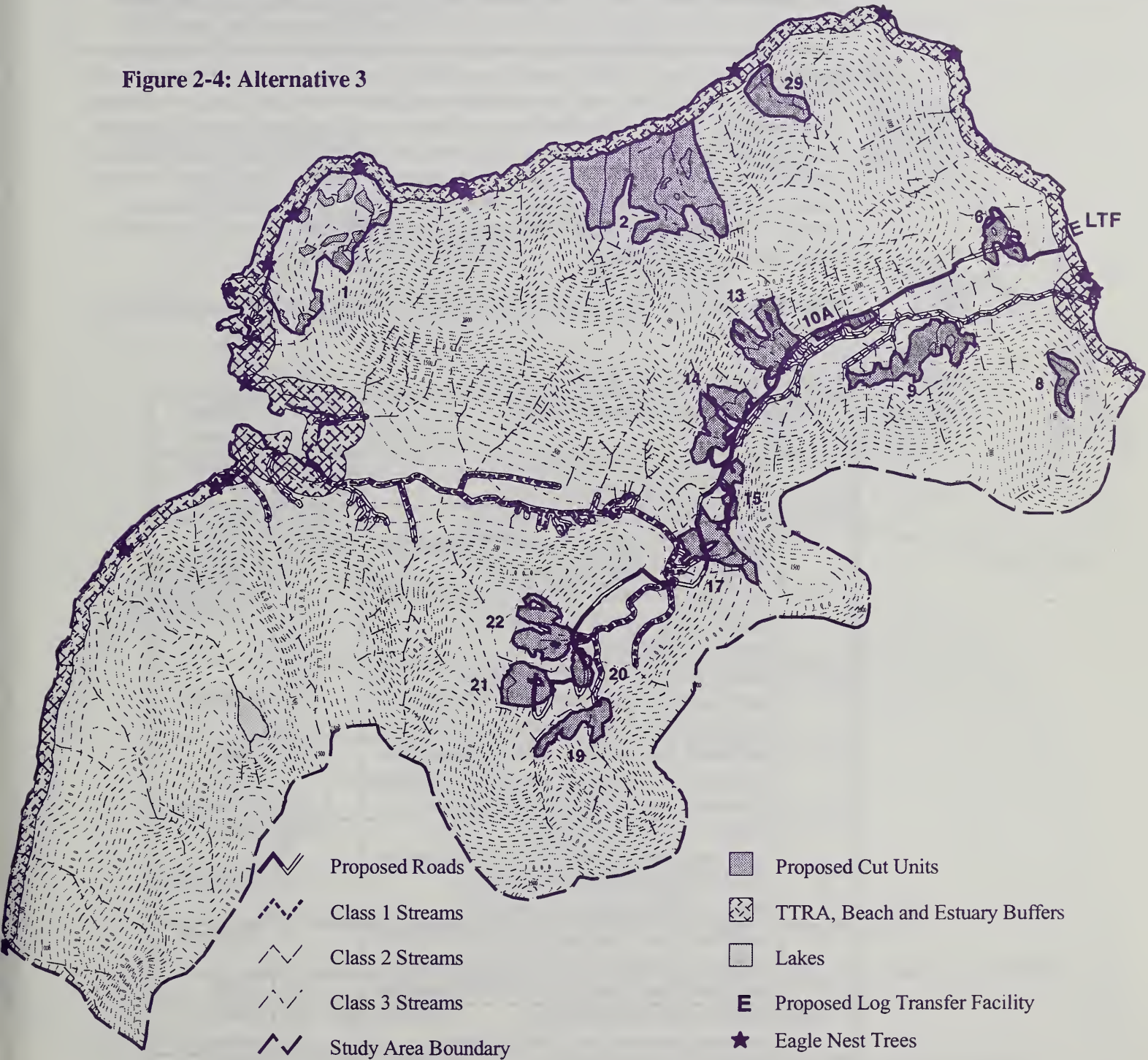
**Table 2-4, Alternative 3 Harvest Units**

Unit	Silvicultural Harvest Method	Acres	Yarding Method
1	Patch Cuts with 10% Retention	46	Helicopter
	Patch Cuts with 30% Retention	24	
2	Group Selection with 70% Retention	131	Helicopter
	Individual Tree Selection with 50% Retention	159	
	Patch Cut with Seedtree Residuals	7	
6	Clearcut with 10% Retention	29	Cable
	Individual Tree Selection with 50% Retention	3	
8	Group Selection with 70% Retention	15	Helicopter
	Patch Cut with Seedtree Residuals	11	
9	Individual Tree Selection with 50% Retention	5	Helicopter
	Overstory Removal with 30% Retention	71	
10A	Individual Tree Selection with 30% Retention	13	Cable
13	Clearcut with 10% Retention	30	Cable
	Overstory Removal with 10% Retention	27	Helicopter
14	Clearcut with 10% Retention	33	Cable
	Overstory Removal with 10% Retention	22	Helicopter
15	Individual Tree Selection with 30% Retention	14	Cable
17	Clearcut with 10% Retention	35	Cable
	Individual Tree Selection with 30% Retention	22	Helicopter
19	Individual Tree Selection with 50% Retention	36	Helicopter
20	Clearcut with 10% Retention	16	Cable

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21	Clearcut with 10% Retention	36	Cable
22	Clearcut with 10% Retention	61	Helicopter
29	Individual Tree Selection with 50% Retention	36	Helicopter
	Patch Cut with 30% Retention	13	

Figure 2-4: Alternative 3



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### Alternative 4

*Alternative 4 avoids harvest in the entire King George watershed.*

Alternative 4 emphasizes public concerns over economic return, freshwater systems, and habitat conservation (Key Issues 2, 3, and 4). Timber harvest would occur primarily along the slopes facing Chichagof Pass, Zimovia Strait, and Honeymoon Creek. Very little harvest would occur within the entire King George watershed, thus retaining one of the largest contiguous blocks of old-growth habitat in the area. Impacts to freshwater systems would be minimized in the King George watershed by dropping units 18-26. Approximately 16.2 MMBF of timber would be harvested from about 943 acres under Alternative 4. About 14 MMBF would be available for future entries, but almost all of it would need to be accessed with further road development in the King George watershed. Approximately 78 acres of the total proposed harvest could easily be logged by a small operator. Approximately 5.3 miles of road would be constructed originating from an LTF north of Honeymoon Creek. Alternative 4, as shown in Table 2-5 and Figure 2-5 below, would propose clearcutting on 82 acres (9% of the acres to be harvested). Again, an asterisk (\*) has been placed next to those units that differ in design from those pictured under the Proposed Action.

**Road Management:** The main road along Honeymoon Creek would remain open to vehicular access.

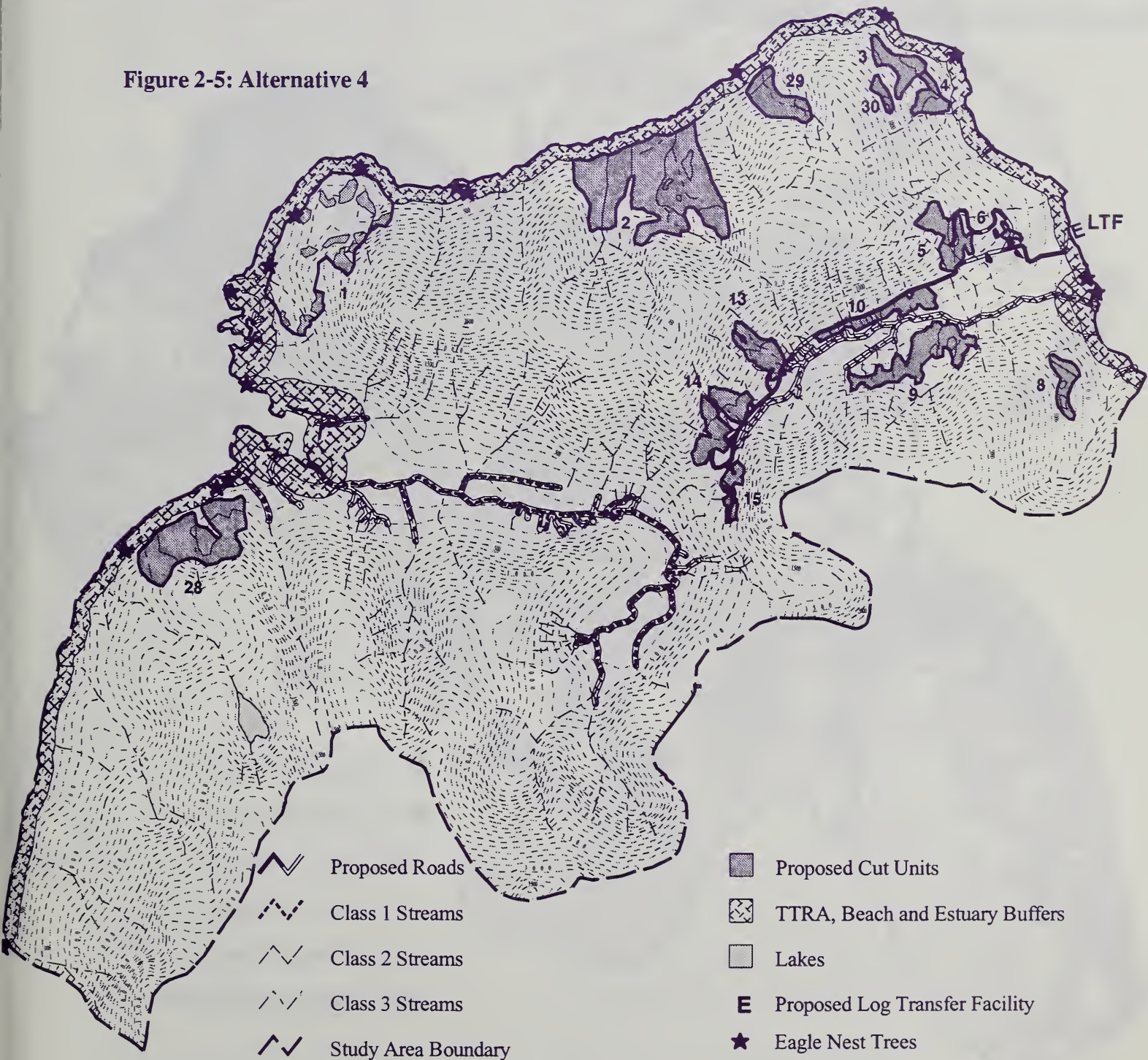
**Table 2-5, Alternative 4 Harvest Units**

Unit	Silvicultural Harvest Method	Acres	Yarding Method
1	Patch Cuts with 10% Retention	46	Helicopter
	Patch Cuts with 30% Retention	24	
2	Group Selection with 70% Retention	131	Helicopter
	Individual Tree Selection with 50% Retention	159	
	Patch Cut with Seedtree Residuals	7	
3	Individual Tree Selection with 50% Retention	24	Helicopter
	Patch Cut with Seedtree Residuals	2	
	Patch Cut with 10% Retention	8	
4	Group Selection with 70% Retention	10	Helicopter
	Individual Tree Selection with 50% Retention	5	
	Overstory Removal with 10% Retention	9	
5	Individual Tree Selection with 30% Retention	20	Cable
	Individual Tree Selection with 50% Retention	20	Skyline
	Overstory Removal with 10% Retention	11	Helicopter
6	Clearcut with 10% Retention	29	Cable
	Individual Tree Selection with 50% Retention	3	
8	Group Selection with 70% Retention	15	Helicopter
	Patch Cut with Seedtree Residuals	11	
9	Individual Tree Selection with 50% Retention	5	Helicopter
	Overstory Removal with 30% Retention	71	
10	Individual Tree Selection with 50% Retention	32	Cable
13*	Clearcut with 10% Retention	20	Cable
	Overstory Removal with 10% Retention	15	Helicopter
14	Clearcut with 10% Retention	33	Cable
	Overstory Removal with 10% Retention	22	Helicopter
15	Individual Tree Selection with 30% Retention	14	Cable

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28	Group Selection with 70% Retention	77	Helicopter
	Individual Tree Selection with 30% Retention	13	
	Individual Tree Selection with 50% Retention	49	
29	Individual Tree Selection with 50% Retention	36	Helicopter
	Patch Cut with 30% Retention	13	
30	Individual Tree Selection with 50% Retention	3	Helicopter
	Patch Cut with Seedtree Residuals	1	
	Patch Cut with 30% Retention	6	

Figure 2-5: Alternative 4



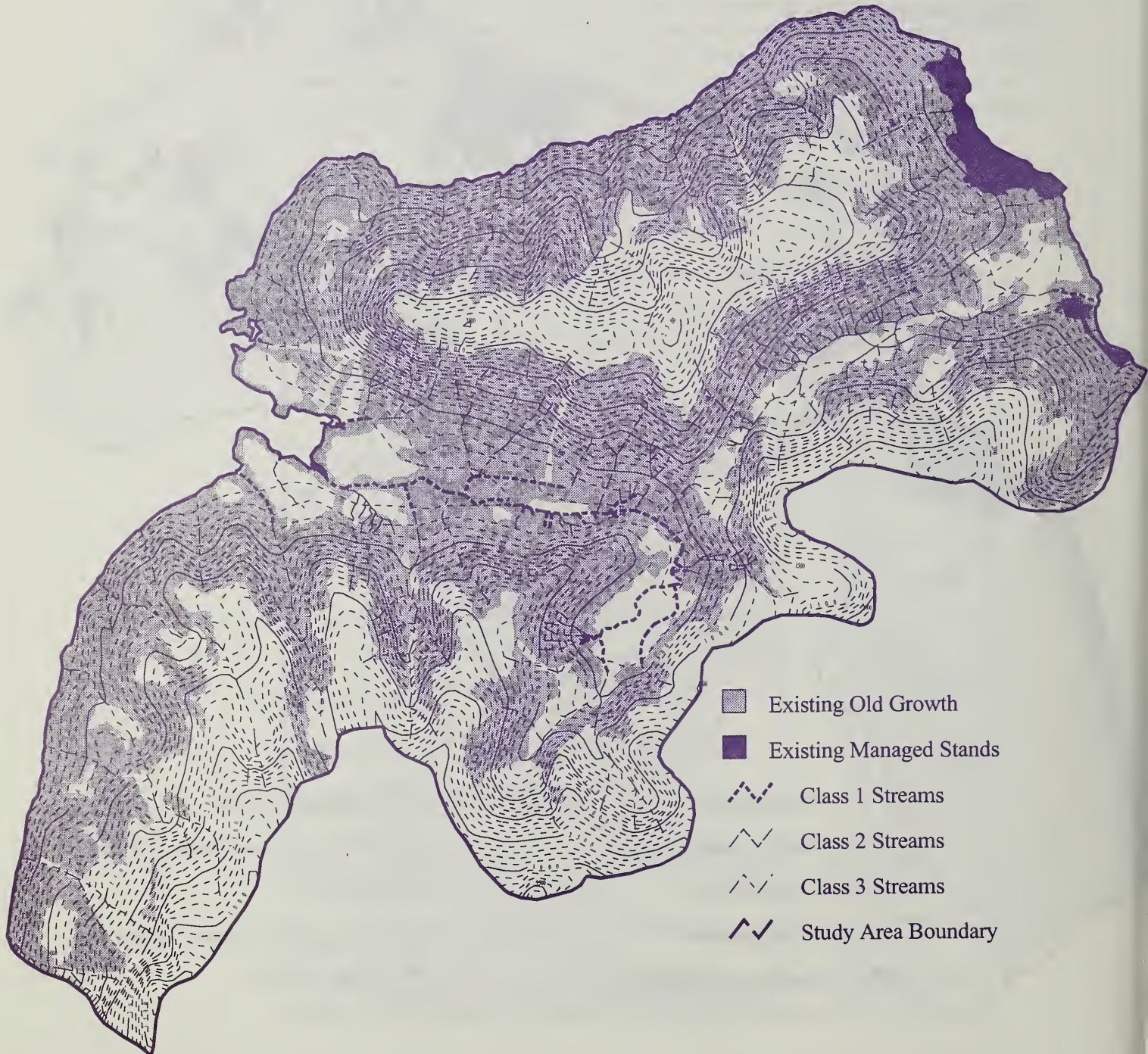
## 2 - Alternatives

### No Action (Alternative 6)

*Alternative 6 would not harvest any portion of the planning area.*

This alternative analyzes the effects of having no timber sale or road construction in the King George study area. This alternative is provided so that you can see the changes that the other alternatives have on the social, physical, and biological environment. This alternative is most responsive to scenic and recreation values, freshwater systems and habitat conservation by deferring harvest. It would not contribute to local employment or income.

Figure 2-6: Alternative 6 (No Action Alternative)



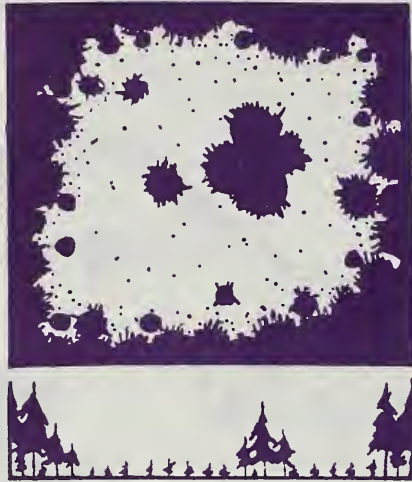
## 2 - Alternatives

Figure 2-7, Designated Old Growth Retention - All Alternatives



## 2 - Alternatives

Figure 2-8, Illustrations of Various Harvest Methods - All Alternatives



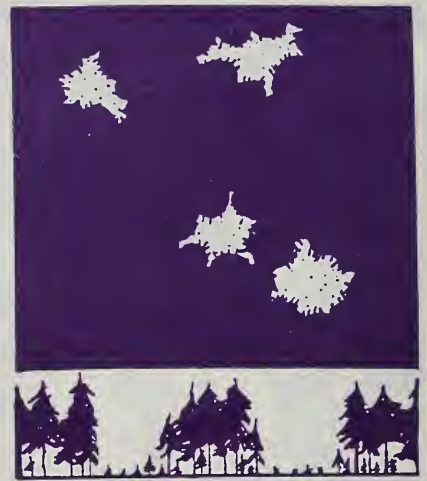
Clearcut w/ retention



Individual tree w/ 30% retention



Individual tree w/ 50% retention



Group selection w/ 70% retention



Overstory removal w/ 10% retention



Patch cut w/ retention

## 2 - Alternatives

### Alternative Comparison

Tables 2-6 and 2-7 compare treatment acres and predicted harvest volume for each of the action alternatives. It is important to note that differences in harvest prescriptions will result in different harvest volumes per acre. For example, a 100 acre volume class 5/6 block treated with a group selection prescription that retains 70% of the basal area, will remove approximately 40% of the standing volume and will show an average yield of 10-12 thousand board feet per acre. This theoretical 100 acre stand could be entered two or three more times in the next 100 years to harvest much of the remaining 70% in new groups as the first entry begins to mature.

**Table 2-6: Alternative Summary for the King George Study Area**

	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6 No Action
<b>Timber Harvest</b>						
Manageable Acres Available	4224	4224	4224	4224	4224	4224
Proposed Treatment Acres	888	968	894	943	1393	0
% of Manageable Treated	21%	23%	21%	23%	33%	0%
<b>Harvest Volume (MBF)</b>						
Cable Volume	0	9,300	7,450	4,040	8,650	0
Helicopter Volume	<u>14,060</u>	<u>10,200</u>	<u>9,250</u>	<u>12,130</u>	<u>18,190</u>	<u>0</u>
Total Volume	14,060	19,500	16,700	16,170	26,840	0
<b>Road Construction Miles</b>						
Specified Road	0	9.8	6.6	4.8	9.6	0
Spur Road	<u>0</u>	<u>1.0</u>	<u>1.1</u>	<u>.5</u>	<u>1.2</u>	<u>0</u>
Total Road Miles	0	10.8	7.7	5.3	10.8	0
<b>Log Transfer Site</b>	No	Yes	Yes	Yes	Yes	No
<b>Harvest By Volume Class</b>						
Vol. 4 (2,565 Acres Existing)	248	237	317	244	337	0
Vol. 5 (4,315 Acres Existing)	420	371	327	475	589	0
*Vol. 6 (2,347 Acres Existing)	209	360	243	200	447	0
*Vol. 7 (163 Acres Existing)	11	0	7	24	20	0

\* Note- The percentage change between existing and remaining Volume Class 6 & 7 under Alternatives 1, 3, 4 and 6 is less than 1%. The percentage change for Alternative 2 and Alternative 5 is 1.2% and 1.1% respectively. Thus, harvest is proportional to the existing volume class distribution within or just over 1% under all alternatives.

**Table 2-7: Harvest by Alternative (Acres)**

Land Unit Name	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6
Chichagof Face	407	407	407	407	407	0
Honeymoon	178	111	246	276	299	0
Lower King George	66	230	9	39	260	0
Porcupine Gulch	10	0	10	10	10	0
Red Mountain Face	110	0	0	110	110	0
Upper King George	0	220	220	14	220	0
Zimovia Face	117	0	2	87	87	0
<b>Total Acres</b>	<b>888</b>	<b>968</b>	<b>894</b>	<b>943</b>	<b>1,393</b>	<b>0</b>
<b>Estimated MBF</b>	<b>14,060</b>	<b>19,500</b>	<b>16,700</b>	<b>16,170</b>	<b>26,840</b>	<b>0</b>

Table 2-8, Alternative Comparison Table

	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6
Visible Acres Harvested in Zimovia Strait Viewshed	258 (9%)	67 (2%)	157 (5%)	259 (9%)	259 (9%)	0
Visible Acres Harvested in Chichagof Pass Viewshed	131 (5%)	131 (5%)	131 (5%)	131 (5%)	131 (5%)	0
Visible Acres Harvested in Stikine Strait Viewshed	175 (3%)	235 (4%)	65 (1%)	155 (2%)	374 (6%)	0
Visible Acres Harvested in Bessie Peak Viewshed	95 (2%)	438 (7%)	385 (6%)	208 (4%)	533 (9%)	0
Volume	14,060 MBF	19,500 MBF	16,700 MBF	16,170 MBF	26,840 MBF	0
Percent of Manageable Acres Treated	21%	23%	21%	22%	33%	0%
Miles of Road Construction	0	10.8	7.7	5.3	10.8	0.0
Miles of Road Open to Motorized Vehicles (after harvest)	0	4.0	4.4	3.8	4.0	0
Net Stumpage	\$23/MBF	-\$3/MBF	\$12/MBF	\$11/MBF	\$10/MBF	0
Critical Stream Crossings	0	10	5	1	7	0
Acres Harvested in Freshwater System	260	560	480	350	790	0
Miles of Road in Freshwater System	0	9.8	6.7	3.3	9.7	0
Wetland Acres Harvested	116	138	157	146	202	0
Wetland Acres Roaded	0	22	9	4	15	0
Acres Harvested on Mod to High Hazard soils	205	348	280	255	379	0
# Feet of Road Construction on Moderate to High Hazard Soils	0	2,812	0	0	5,679	0

Scenery Values

Economics

Freshwater System

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### Habitat Conservation

	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6
Habitat Capability as a % of Current Condition for:						
Deer	97%	94%	96%	96%	92%	100%
Marten	95%	94%	95%	95%	90%	100%
Black Bear	99%	99%	96%	96%	96%	100%
Red Squirrel	96%	95%	96%	96%	92%	100%
Hairy Woodpecker	91%	88%	90%	90%	84%	100%
Brown Creeper	97%	90%	95%	96%	86%	100%
Travel Corridor Maintained to:						
Chichagof Face	Yes	Yes	Yes	Yes	Yes	Yes
Honeymoon	Yes	No	No	No	No	Yes
Red Mountain	Partial	Partial	Yes	Partial	Partial	Yes
Kunk Lake	Yes	Partial	Partial	Yes	Partial	Yes
Fishtrap	Partial	Partial	Yes	Yes	Partial	Yes
Drainage						
Acres in Patches Larger Than:						
5,000 Acres	0	0	0	0	0	5,890
1,000 Acres	8,350	7,660	8,220	8,220	7,591	10,140
500 Acres	8,350	8,590	9,065	8,220	7,591	10,140
180 Acres	9,050	9,000	9,335	9,055	8,382	10,550
Weighted Mean Old Growth Block Size	1,960	1,350	3,120	1,860	1,155	5,390

### Alternatives Dropped From Further Review

The initial scoping letter to the public identified a broad proposed action to harvest 30 million board feet. During our landscape and desired future condition analysis (see summary in Appendix A), we refined our proposed action to be more specific and determined that the highest volume we could expect to produce was approximately 25 million board feet by harvesting about 1300 acres.

### Mitigation Measures for Alternatives 1-5

*Site specific mitigation measures are identified in the Unit and Road Cards in Appendix B.*

The Forest Service uses a variety of mitigation measures in the design and implementation of timber sales to avoid or reduce impacts to the environment. Some of these mitigation measures are required by law; for example, streamside buffers. Some are included in our policies for the Forest Plan. Others are very specific to a particular location or unit. These actions and their site-specific application are documented on the unit and road cards in Appendix B. Described below are the mitigation measures we will use for this project under all action alternatives.

#### Cultural Resources

Based on inventory work in the King George study area and elsewhere in Southeastern Alaska, we developed a model to help us locate those areas where cultural resources are most likely to be found. In addition to providing a basis for the comparison of alternatives, this model helps identify areas where we will intensively survey for cultural sites prior to any ground-disturbing activity. If additional cultural resources are located, appropriate mitigation and protection will be designed in consultation with the Alaska State Historic Preservation Officer.

#### Best Management Practices

Best Management Practices (BMPs) are practices and operating procedures designed to protect water quality. The BMPs are the result of extensive efforts between the Forest Service and the State of Alaska to identify practices that will ensure that timber harvest activities minimize soil erosion and protect aquatic habitat. The unit and road cards in Appendix B, and the log transfer facility design card in Appendix D, describe site-specific application of BMPs.

#### Stream-side Buffers

The Tongass Timber Reform Act mandates a minimum 100-foot wide, no-harvest buffer on both sides of all Class I streams and on those Class II streams that flow directly into Class I streams. Some streamside buffers in this project are wider than 100 feet in response to site-specific conditions such as the stream channel type and the width of floodplains. Specific information about streamside buffers is located on the unit cards in Appendix B.

#### Marbled Murrelets

Marbled murrelets are known to occur in the waters around the study area and there is evidence that they nest in the study area. No nests have been located. If a nest is located, we will implement a minimum 30-acre buffer surrounding the nest. Roads will be kept

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out of these buffers whenever possible, but if unavoidable, will be located the furthest possible distance from actual nest sites.

### **Goshawks**

Field surveys for goshawks were conducted from 1992-1994, but they were conducted before the proposed harvest units were designed, so many units were not surveyed. One goshawk was observed within the planning area in 1994. Although no nests have been located, possible evidence of a nest area was found in one unit in 1995. The goshawk is not presently classified as Threatened or Endangered, but it is recognized as a Regional Sensitive Species. If a goshawk nest should be found in the study area during this project we will implement the recommendations found in the "Interim Habitat Management Recommendations for the northern goshawk; Tongass National Forest 1992." A copy of these guidelines is available from the Stikine Area Forest Supervisor's office in Petersburg, Alaska.

### **Key Wildlife Habitats and Timing Restrictions**

No harvest is scheduled within 500 feet of the beach or within 1000 feet from the King George and Honeymoon estuaries. Minimum clearing widths will be used on the road and log transfer site north of Honeymoon Creek if it is constructed. The location for the proposed transfer site was selected because it had the least environmental effects of the seven sites studied. In addition, we located the sort yard outside of the beach fringe.

Blocks of old growth habitat have been designated in the project area for all alternatives and are shown above in Figure 2-6. These blocks of habitat were selected where they could do the most good for wildlife, according to Forest Plan direction. Harvest is precluded in these areas. In addition, more old growth will remain in areas which are classified as unsuitable for timber production (such as very steep areas).

Roads access may be restricted to motorized vehicles in some alternatives (see alternative descriptions). Road closures can be useful in reducing the hunting and recreation pressure on certain species of wildlife, particularly wolves, marten and bear. If closed, roads would be available for walk-in recreation, but not motorized recreation. Road closures within the King George Creek watershed would have the most value to wildlife since this area contains most of the retained blocks of old growth. All temporary roads and some segments of specified roads will have access blocked, culverts and bridges removed and the natural drainage pattern restored after harvest (see Road Cards in Appendix B).

Helicopter flight guidelines will ensure the protection of eagle nest trees in the project area. Repeated helicopter flights within 1/4 mile of nest trees will be avoided from March 1- May 31. If nest trees have young, we will extend additional protection from May 31- August 31. Helicopters will be restricted from flying near sea lion haulouts and whales.

### **Log Drops and Storage**

Storage of logs within log booms in saltwater will take place in locations designated in Appendix D. Logs will not be directly dropped into saltwater to address the concern of logging debris interfering with commercial fishing operations in the area. As part of the timber sale contract, we will require that the operator yard all helicopter units to the nearest road system or to a processing barge anchored near the unit. We will also require that any floating debris that escapes the confines of log booms or the processing barge be immediately retrieved. This should help, but not completely eliminate the possibility of

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limbs getting caught in fishing nets. It will eliminate the possibility of an accumulation of limbs or logs on the ocean floor that may interfere with beam trawlers or shrimp and crab pots.

### Logging Camp

Due to the proximity of the project site to Wrangell, no logging camp is being planned or permitted within the project area.

## Preferred Alternative

*We prefer Alternative 5 with some considerations for small sales over time and the scenery of Zimovia Face.*

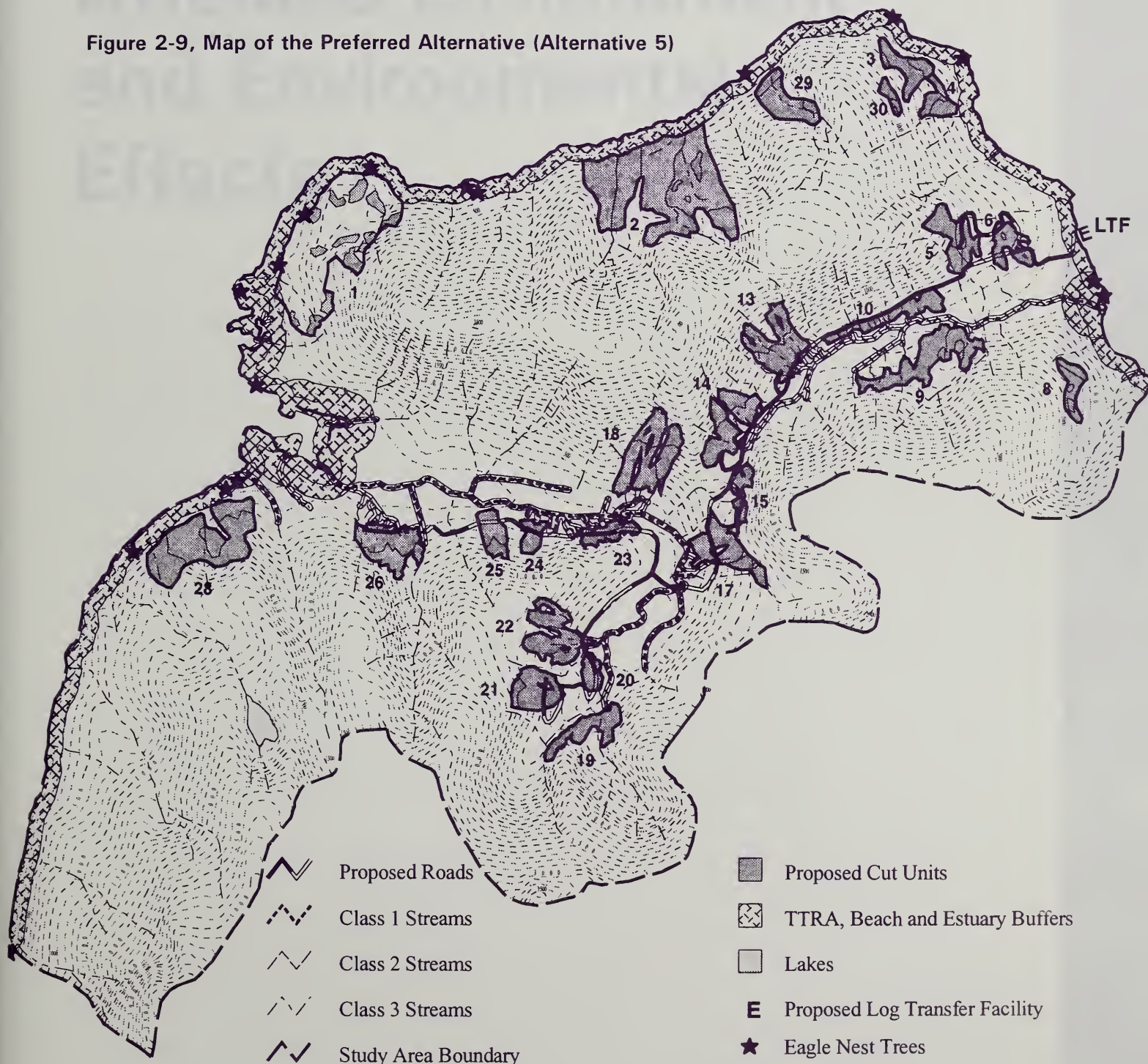
The **Preferred Alternative** designated in the Draft Environmental Impact Statement (DEIS) is Alternative 5. Several adjustments were made to this alternative between the Draft and Final EIS in response to public and other agency comments:

- We will harvest Units 3, 4, 30 and part of Unit 5 on the Zimovia Face with helicopter partial cuts. The road will be constructed only to Unit 5 thus eliminating the need for the entire segment of road across Zimovia Face. This will address many of the scenic quality concerns of Zimovia Highway residents.
- We will administratively defer harvest of Units 6, 10, 15, 20, 23 and 24 as future small sales. This will make about 124 acres and approximately 4 MMBF available to small operators over the next 5 years.
- We changed the harvest prescription for Units 10-12 by combining them into one unit which will be logged with a combination of individual tree or group selection and patch cuts. This area will be managed for high quality wood fiber (large trees with pruning and thinning) sought by operators interested in producing high value wood products. This change also helps maintain the values of the lower portion of the Volume Class 7 Honeymoon Stand. Under this alternative, fragmentation of this stand is minimized and over time, patches of large trees will be maintained in this managed portion of the stand.
- Road Segment 5 was dropped and Unit 18 will be harvested entirely with a helicopter. This will allow us to minimize soil disturbance and maintain smaller diameter trees within the harvest unit. Islands of trees will also be retained where they are windfirm and there is a low risk that they will affect water quality in the event they blow over. These changes were made to reduce the risk of sedimentation into King George Creek.
- Road Segment 4 only has two hydrological sites requiring major structures. A gate will be placed on the first site to restrict motorized access during the intermittent life of the project and after harvest.
- Road Segment 7 will be a specified road leading as far as Unit 21. The portion of road into Unit 22 (Segment 22) was dropped (along with the stream crossing). After harvest, we will block access, remove culverts and restore the natural drainage pattern. This road segment has one stream crossing at the beginning of the segment which will be removed. Unit 22 will be harvested entirely with helicopter which will minimize ground disturbance and allow us to maintain smaller diameter trees distributed within the harvest unit. Islands of windfirm trees will also be retained which will not endanger water quality in the event they blow down.. These changes were made to reduce the risk of sedimentation into King George Creek.

## 2 - Alternatives

- Road Segment 8 will have all drainage structures removed (log bridges and culverts) beyond and including the first hydrological site which is located between Units 25 and 26 and the natural drainage patterns will be restored.
- Those road segments beyond the gate in Segment 4 (just beyond Unit 17), which do not have their drainage structures removed, will be maintained by intermittent administrative vehicle access. Safe-guard measures (overflow dips) will also be implemented to at stream crossings to help minimize effects on water quality should a minor structure fail after the intermittent life of the project. All major hydro sites beyond the gate with the exception of the bridge across King George Creek will be removed after harvest.

Figure 2-9, Map of the Preferred Alternative (Alternative 5)



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# **Chapter 3**

## **Affected Environment and Environmental Effects**

# Chapter 3

## Affected Environment and Environment Effects

# Chapter 3

## Affected Environment and Environmental Effects

### Introduction

In this chapter, we describe the environment that will potentially be modified by this project (affected environment), and the effects of the six alternatives on the environment (environmental effects). This chapter is divided into two main sections:

**Effects on the Key Planning Issues** - In this section, we will describe the effects of each alternative on the four key planning issues.

**Other Environmental Considerations** - In this section we discuss some of the other environmental considerations required by various laws.

### Effects on the Key Planning Issues

The Council on Environmental Quality (CEQ) issues guidance to the Federal Agencies to determine the significant issues concerning any proposal and to eliminate those issues which are not significant. With the help of the public and other agencies, we identified four issues which were significant enough to be examined in detail given the nature of the proposed action. In this section, we describe the environmental effects associated with these four issues.

### 3 - Affected Environment and Environmental Effects

## Issue One: Scenic and Recreational Values

### Scenic Resources

*"I don't understand why we can't have one island near Wrangell that is left alone! Why can't you pick on other islands or on the mainland, away from where we have to look at it all the time."*

*"We consider the King George area very scenic and spend time there often...While we could accept some cuts in this area, logging it all would create an eyesore out of a beautiful place."*

*"We can see the King George project area from our living room window and to see logging there won't hurt our feelings."*

***Partial cutting is the main harvest method.***

The above comments show the range of opinion about the scenic importance of this area. Some felt that the area should be left alone, others think that some careful logging could take place, and some 'see' any logging as positive. Based on this range of opinions, we responded by often using other techniques besides clearcutting, so that any harvest units seen would not be as stark a contrast to the surrounding area. These techniques are used in all alternatives. However, the range of alternatives does vary the amount of harvest that would occur from different views. For example, some of you felt that we should not harvest the Zimovia Face while others felt that some harvest there would be fine. Therefore, the alternatives vary from no harvest to some harvest with small clearcuts or partial cuts. In listening to the various opinions, we tried to find a balance so that all alternatives are responsive to this issue while still realizing that there is not agreement on how much timber should be harvested from different areas.

In response to public comments we:

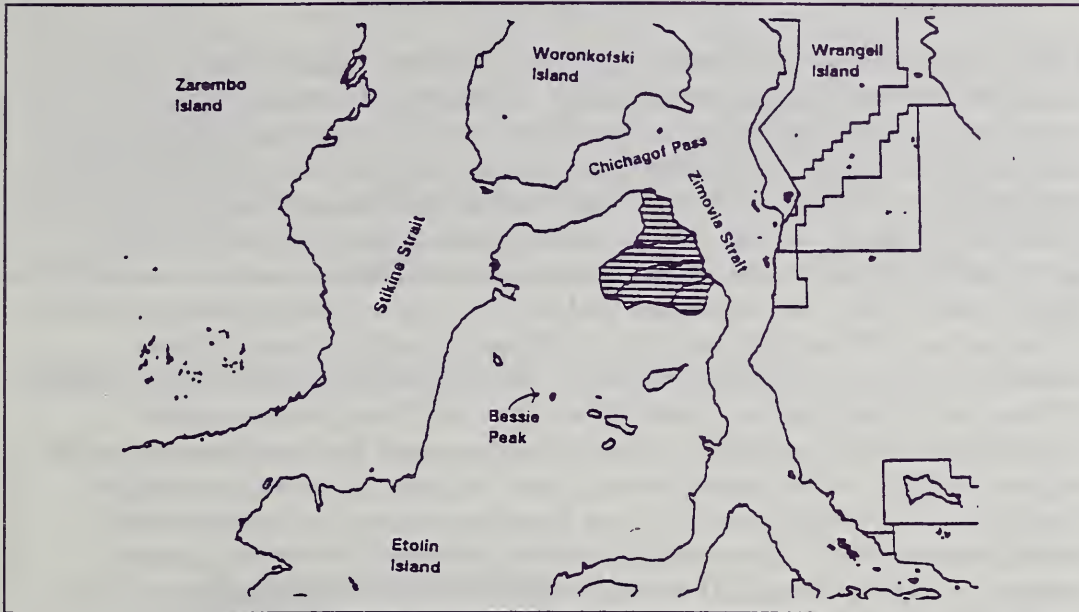
1. Used other techniques besides clearcutting in most areas to avoid stark contrasts between harvested and unharvested areas. We also designed some units to look like natural disturbances such as blowdown or landslides.
2. Developed alternatives that did not harvest some areas at all. We also varied the amount of roading that would take place among the alternatives.
3. Did not propose to harvest any more than 14% of any viewshed so that harvest would not dominate the scenery.
4. Designed the log transfer site to minimize cutting into the rock and slopes near the shoreline. Rock pits and sort areas are located 1/2 mile from the beach.

So that you can see the differences in each alternative, our analysis looks at four travel routes around or in the King George Study Area. These travel routes include Zimovia Strait, Chichagof Pass, Stikine Strait, and Bessie Peak. Most scenic viewing of the study area occurs from these travel routes.

### 3 - Affected Environment and Environmental Effects

#### Zimovia Strait Viewshed

Figure 3-1: Zimovia Strait Viewshed



This viewshed includes everything you can see of the study area from Zimovia Highway, residences, and waterways. The viewshed is made up of the Zimovia Face, Honeymoon North, Honeymoon South, and Porcupine Gulch Land Units.

Zimovia Strait provides marine access to points south, including Thoms Place, and Kunk Lake Trailhead. This viewshed is well known and familiar to the residents of Wrangell Island, since they view it from Wrangell for long periods of time. Some see the area from their homes and are concerned about what they will see if it's harvested. Others indicated that they would have no problem with clearcutting in this viewshed, however the more prevalent comments pushed to minimize clearcutting. Alternative harvest methods to clearcutting were suggested by some respondents.

Of the 3,771 acres included in this viewshed, approximately 2,949 acres (or 78%) are inventoried as "seen" from the water, and visually sensitive to harvest. Designing future harvest in this area is further complicated by previous harvest. The most visible harvest unit is 160 acres in size and was clear-cut in 1965. This unit is recovering visually, with the trees growing back to almost 1/3 the height of the surrounding trees. A limited amount of selective harvest around this unit could actually improve its visual recovery as long as it softens the straight lines without adding significantly to its perceived size. There are almost no other visible openings except those that are man-made, so any additional harvest is more likely to "stand-out." However, there are several pockets where the cedar is dying (seen as a gray cast of dead trees). There is an opportunity to harvest these dead trees in such a way that it can slightly improve the scenic condition of the area by softening the lines of the existing clearcut.

Another issue in this viewshed is the visibility of the transportation system. If we harvested by using cable systems, we would need to build a road across the Zimovia Face land unit. Also, since less trees can be left in cable logged units (as compared to helicopter yarding) the size of harvest units would have to be smaller to meet scenic quality objectives. Thus, some of the alternatives we developed use cable yarding and some use helicopter yarding. If roads are built, there is a need for a log transfer site at the

*Zimovia Face is the most sensitive viewshed in the project area.*

*Old harvest units affect views of Zimovia Face.*

*Roads and cable logged units will have more effects than helicopter units.*

### 3 - Affected Environment and Environmental Effects

beach to get the logs to water. This log transfer site would be located in this viewshed almost directly across from the Pat's Creek log transfer site on Wrangell Island.

#### Effects of the Alternatives on Views from Zimovia

**Effects of the Proposed Log Transfer Facility (LTF) Site-** Alternatives 1 and 6 do not propose to construct a log transfer facility. Alternatives 2, 3, 4 and 5 propose to construct a log transfer facility on Zimovia Strait. The LTF would consist of a low angle ramp (similar to the ramp at Earl West, locally known as 'Venus', Cove). A bulkhead for watering logs would not be necessary. Logs would be taken down the ramp to water or be floated off the ramp by the tide. The tree clearing opening along the beach would be approximately 200 feet and the height of backwalls from hillside excavation would be approximately 24 feet. By comparison, the LTF at Pat's Creek has approximately 400 feet of clearing and a 100 foot high backwall. Additionally, the Pat's Creek LTF has a permanent watering ramp and two bulkheads. The larger bulkhead at Pat's Creek is about 100' long and 24' high (partially visible from a -2' to a +22' tide), and the smaller equipment bulkhead is comparable to what is being proposed for King George (about 20' wide and 16' high, partially visible from a -2' to a +14' tide). The visual impact of the Zimovia Strait LTF would be minor as seen from the residences on Wrangell Island, having approximately 1/4 the visual impact of the Pat Creek LTF from the Zimovia waterway. The King George LTF would be comparable in size to the Earl West LTF on Wrangell Island but would have less visual impact because the backwall is lower and there is not as much fill required. A sketch comparing the Earl West and King George LTF's is located in Appendix D.

*The proposed log transfer facility is about 1/4 the size of Pat's Creek LTF. See Appendix D for a sketch of the LTF.*

*The greatest visual impact comes from building road across Zimovia Face. This proposed road was dropped between the Draft and Final EIS.*

**Effects of Road Construction-** Alternatives 1 and 6 construct no roads and would not have any visual effects from roading. Alternative 2 would only construct a road up Honeymoon Creek on the south side and since there would be no harvest along this road, it would not be seen. Alternative 3 would construct a road on the north side of Honeymoon Creek but harvest of Unit 6 would likely make the road visible in this one location. Alternatives 4 and 5 rely on a combination of helicopter and cable yarding and would only build a portion of the Zimovia Face Road. We estimate that two short portions of road would be visible across Units 5 and 6 under Alternatives 4 and 5.

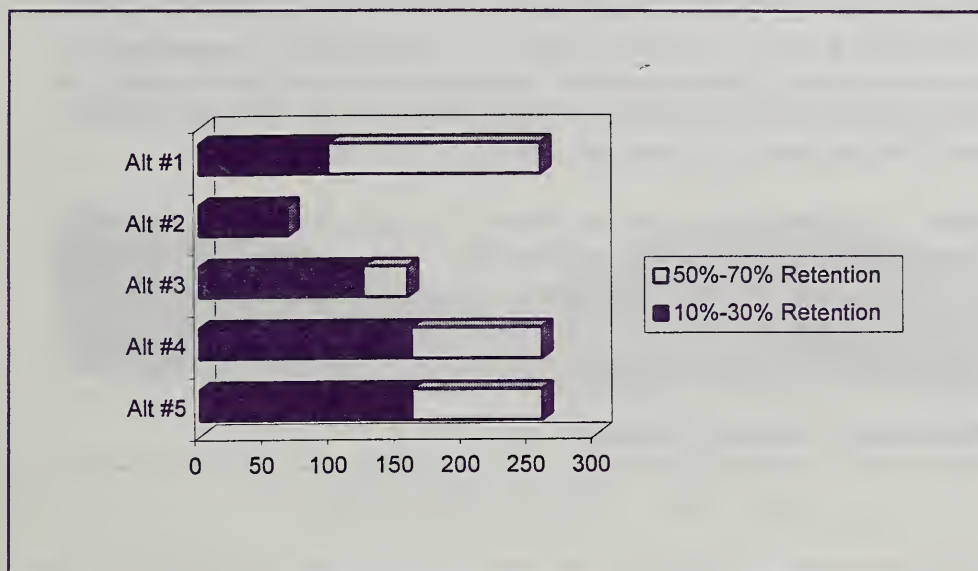
**Effects of Harvest-** Table 3-1 and Figure 3-2 show how many visible (or "seen") acres of the Zimovia Viewshed would be harvested under each alternative. We also show a breakdown of the harvest method. For example, those acres that will be harvested by leaving 70% of the trees standing (GR7-Group Selection prescription) are depicted in the "70% trees left" category. Acres treated with a goal of leaving 10% of the trees standing, whether by overstory removal, patch cut, or clearcut methods (OR1, PR1, and CR1 prescriptions), are depicted in the "10% trees left" category. The "100% trees left" category includes those seen acres which will not be harvested or areas of uncut trees within large harvest units. These harvest prescriptions are explained in greater detail in Chapter 2. In order to show the effects on what you can actually see, only those acres which can be seen from the water are included in the table and graph (the percentage of "total acres" of the viewshed treated would be less).

### 3 - Affected Environment and Environmental Effects

Table 3-1: Seen Acres Harvested in the Zimovia Strait Viewshed

Trees Retained	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6
10% Trees Retained	65	67	97	109	109	0
30% Trees Retained	33	0	27	51	51	0
50% Trees Retained	119	0	18	73	73	0
70% Trees Retained	41	0	15	26	26	0
100% Trees Retained	2,691	2,882	2,792	2,690	2,690	2,949
% of Seen Acres Treated	9%	2%	5%	9%	9%	0%

Figure 3-2: Seen Acres Harvested in Zimovia Strait Viewshed



As illustrated by the above bar graph, only those areas leaving 10-30% of the trees within harvested areas would actually be seen by someone casually observing the area. Harvest leaving 50% or more of the trees would not be noticed by most people, but does present some risk if the trees left blew down. Although we are confident that not all trees will blow down in most areas, there is some unknown risk with this technique, which has not been widely applied in Southeast Alaska. Harvest in the 70% leave category would not likely be seen at all and is fairly resilient to blowdown. Effects of the alternatives are described in order of increasing visual impacts.

#### Zimovia Effects Summary

**Alternative 6** (the "no action alternative") has less overall impact to scenic resources in general since there is no harvest, roading, or log transfer site. There is no risk of additional blowdown caused by experimentation with harvest methods.

**Alternative 2** has less visible harvest than any other 'action' alternative from the Zimovia travel route. All units are located far up the Honeymoon Creek drainage and are not directly across from Wrangell Island views. Alternative 2, like Alternative 6, does not attempt to harvest dying yellow-cedar or take the risk of possibly improving the visual appearance of past harvest. There is no visible road construction, but Alternative 2 does

*Of the action alternatives, Alternative 2 has the least effect on views from Zimovia Highway.*

### 3 - Affected Environment and Environmental Effects

include construction of the log transfer site with the effects described above. Zimovia Highway residents would not perceive a noticeable change in the view from their residences.

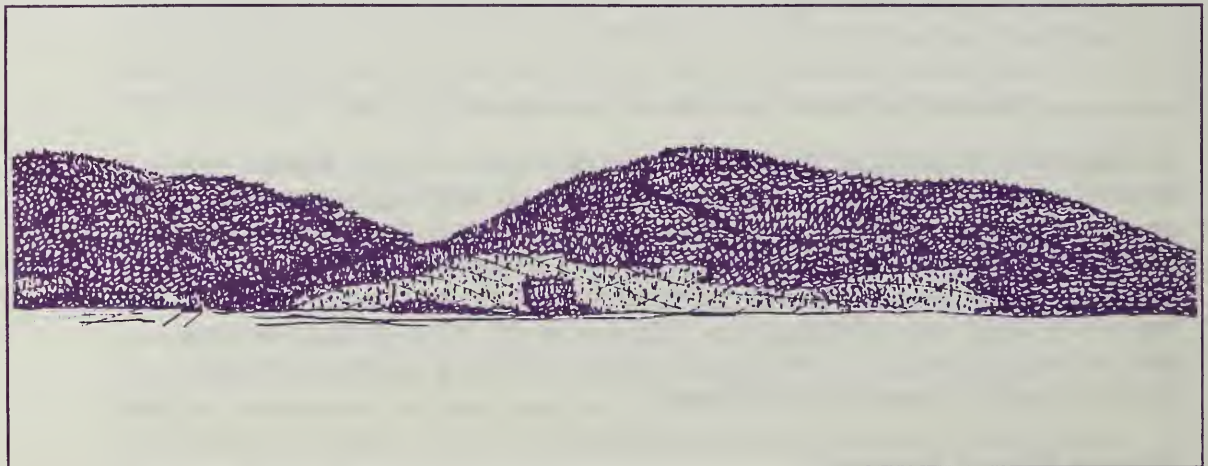
**Alternatives 3 and 1** have similar visual impacts, but for different reasons. Although the graph above shows that more acres will likely be seen in Alternative 3 than Alternative 1, it does not take into account that most of those 'seen acres' are in the background and far up the Honeymoon drainage, thus they are only visible from a few locations and from an oblique angle. Like Alternative 2, the harvest units in Alternative 3 are primarily located in the Honeymoon Creek drainage but are closer to the mouth of the Creek where they have the potential to be seen by Zimovia travelers. Alternative 3 would also construct the log transfer site and a road across Unit 6. Although the graph above shows that Alternative 1 has less acres that are likely to be evident (the black in the bar graph) than Alternative 3, the opposite is true if you only take the views from Zimovia Highway into account. When viewing from Zimovia Highway, proposed harvest in Alternative 1 will be much more apparent than those units proposed in Alternative 3. Alternative 1 would involve more acres of total harvest in the Zimovia viewshed, but a large percentage of the harvest leaves 50% or more of the trees (however, this could present a greater risk if blowdown were to occur). Since Alternative 1 would involve all helicopter yarding, we can harvest more acres with less visual impact than alternatives that use cable systems. Alternative 1 does not involve construction of the LTF or any roads.

*Alternatives 4 and 5 have the same visual effect.*

**Alternatives 4 and 5** have the same harvest effects. The road across Zimovia Face was dropped in Alternative 5 between Draft and Final EIS. A larger portion of the harvest of Zimovia Face is accomplished using helicopter yarding and partial cutting.

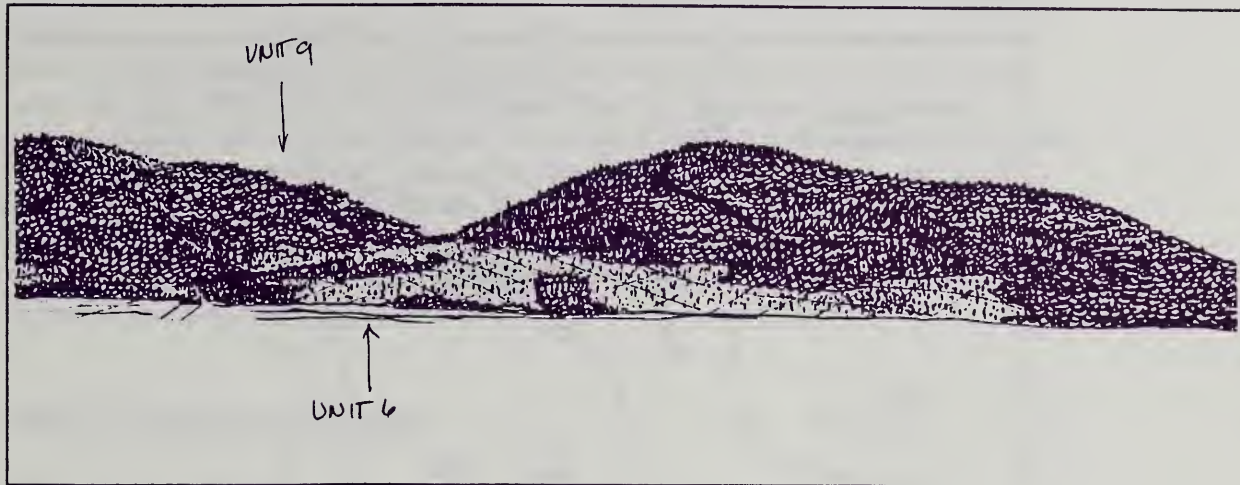
**Figure 3-3: Alternatives as seen from Zimovia Strait**

**Alternatives 6 and 2 (Existing Condition)**

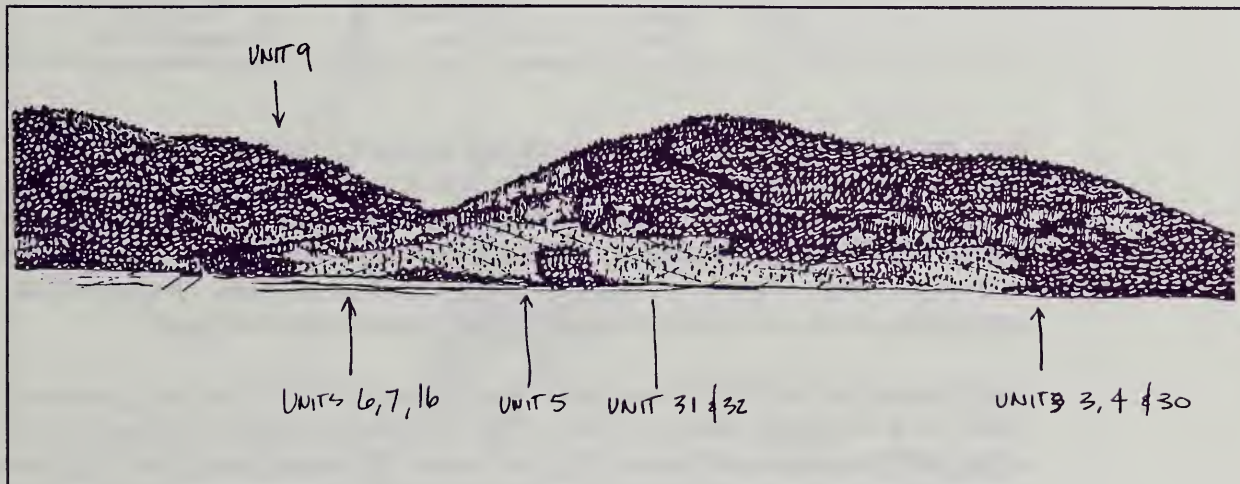


### 3 - Affected Environment and Environmental Effects

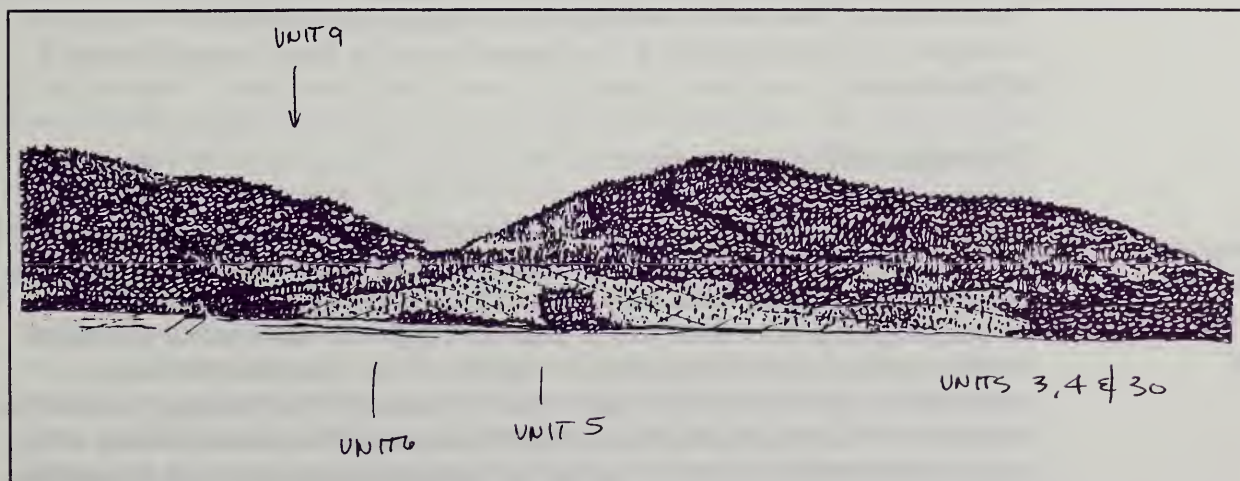
Alternative 3



Alternative 1



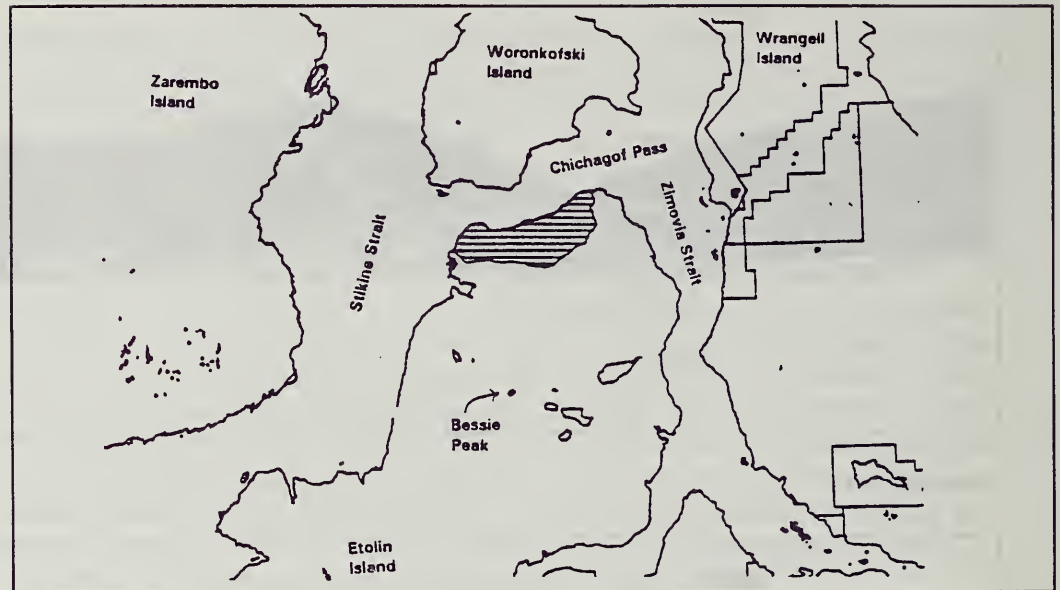
Alternatives 4 and 5



### 3 - Affected Environment and Environmental Effects

#### Chichagof Pass Viewshed

Figure 3-4: Chichagof Pass Viewshed



The Chichagof Pass Viewshed contains only one land unit; Chichagof Face Land Unit. Because this landscape rises steeply from saltwater, it is viewed at an oblique angle from Chichagof Pass. Marine traffic passes by in an east/westerly direction, and views the hillside in the middleground distance. This is a sensitive travel route due to its proximity to Wrangell and its role as a link between Stikine and Zimovia Straits. Chichagof Pass occasionally acts as an alternative passage for the Alaska Marine Highway.

The characteristic landscape is undulating ridges and steep valleys rising to elevations of 2,630 feet at its highest, most central peak. The western most edge of this Land Unit is rolling with numerous small knobs, hills, and valleys. Persons accessing the King George Bay area pass by this landform in the foreground distance. Most prevalent viewing occurs from the ferry and cruise ship route of Stikine Strait. There are some natural openings in the alpine along with small patches of blowdown and some landslides at lower elevations. The presence of these natural openings makes designing harvest easier if these patterns are copied. All acres contained in this land unit are visible from the water, making it highly sensitive.

#### Chichagof Effects Summary

*All action alternatives propose the same three partial-cut units on Chichagof Face.*

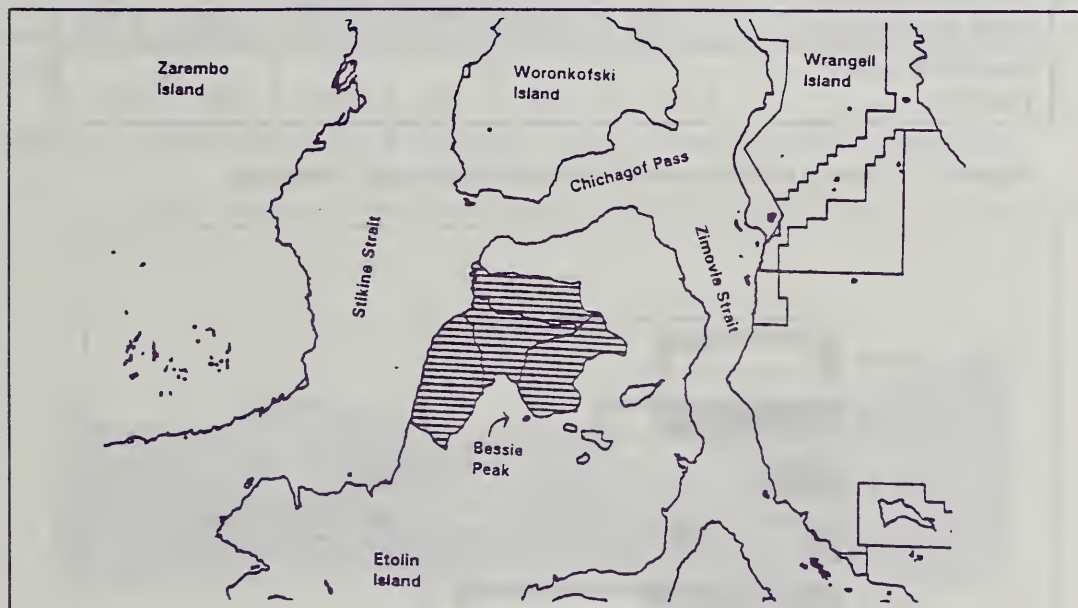
Alternative 6 would not harvest at all in this viewshed, thereby avoiding any detrimental effects or risk to the visual resource. Although this viewshed is sensitive, we felt it was one of the best locations in the study area to try partial cutting. The potential for successful application of non-clear-cut methods is high while the potential detrimental effects to other resources (water, fish and wildlife) is low. Therefore, all 'action' alternatives propose the same harvest of Units 1, 2 and 29 in the Chichagof viewshed and land unit. There are no roads proposed (due to the steep terrain) and all yarding of logs would be done with a helicopter. Harvest units are designed to blend with the landscape and take advantage of the diversity of the terrain found there.

### 3 - Affected Environment and Environmental Effects

In all action alternatives we propose to treat 131 acres by group selection, leaving 70% of the trees standing. None of these units will likely be seen. In all alternatives, we also propose 202 acres of harvest leaving 50% of the trees in the units. These units will not be evident to the casual observer. If portions of the units are visible, they are designed to blend in well with the landscape. Additionally, all alternatives propose to treat 31 acres with 30% of the trees left standing, and 43 acres leaving 10% of the trees standing. Although these areas will likely be seen, they are small harvest units and spread out across the viewshed. Most people will assume they are patches of blowdown since they will look very similar. The use of these harvest methods does present a risk of blowdown by exposing the trees we leave standing in harvest units to winds. The risk is greater in units that leave less trees. However, significant blowdown that would effect the visual appearance of the units is not expected.

#### Stikine Strait Viewshed

Figure 3-5: Stikine Strait Viewshed



This viewshed is comprised of the Lower King George North Facing, Lower King George South Facing, Upper King George, and Red Mountain Land Units. The Alaska Marine Highway and the cruise ships use Stikine Strait to provide access to Wrangell and Ketchikan. View from these marine travel routes are seen in the middle to background distances. Views of the Red Mountain area are dramatic, with alpine areas that reach 3,920 feet in elevation.

Within this viewshed, unique landscapes are found in King George Bay and estuary as well as the Red Mountain area. The estuary is a recreation attraction, with users from Wrangell enjoying the beaches, scenic views and intertidal area surrounding the bay. There are also several old landslides, some of which run the length of the slope. These slides, alpine openings, and mountain peaks provide natural diversity and help make the area one of the most scenic in the study area. The acreage of these four land units totals 9,514 acres of which 6,327 acres (or 67%) can be seen from the waterways.

### 3 - Affected Environment and Environmental Effects

#### Stikine Strait Effects

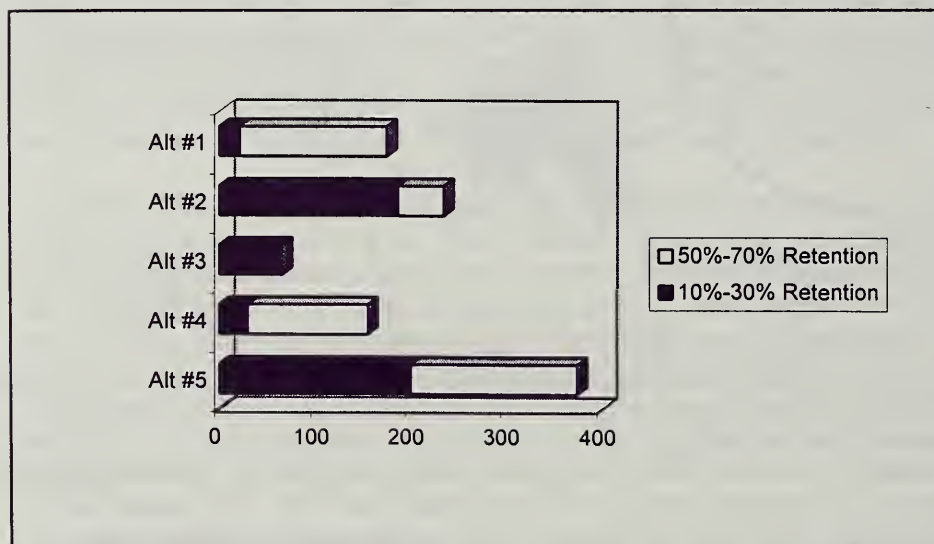
**Effects of Road Construction-** Only **Alternative 2** and **Alternative 5** would construct road in this viewshed. The road would be fairly low in the valley bottom and only portions of the road may be visible within Unit 26. No rockpits would be visible.

**Effects of Harvest-** The Table 3-2 and Figure 3-6 illustrate the relative differences between the alternatives, focusing on how we will treat the seen acres under each alternative using various methods.

**Table 3-2: Seen Acres Harvested in the Stikine Strait Viewshed**

Trees Retained	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6
10% Trees Retained	3	47	30	3	47	0
30% Trees Retained	18	140	35	26	153	0
50% Trees Retained	66	48	0	49	97	0
70% Trees Retained	88	0	0	77	77	0
100% Trees Retained	6,152	6,092	6,262	6,172	5,953	6,327
% of Seen Acres Treated	3%	4%	1%	2%	6%	0%

**Figure 3-6: Seen Acres Harvested in the Stikine Strait Viewshed**



#### Stikine Strait Effects Summary

**Alternative 6** has no detrimental effects on the visual resource since it proposes no road construction or harvest in the Stikine Strait viewshed. **All Action Alternatives** propose harvest of Unit 1 (in the Chichagof viewshed) which can partially be seen from Stikine Strait. The small patch cuts in this unit will be difficult to discern due to their small size and scattered location on an irregular, rolling landscape.

**Alternatives 1, 3, and 4** have similar, insignificant effects to Stikine Strait views for different reasons. Other than Unit 1 mentioned above, Alternative 3 does not propose any harvest within five miles of King George estuary. Only Unit 17 is expected to be seen in

### 3 - Affected Environment and Environmental Effects

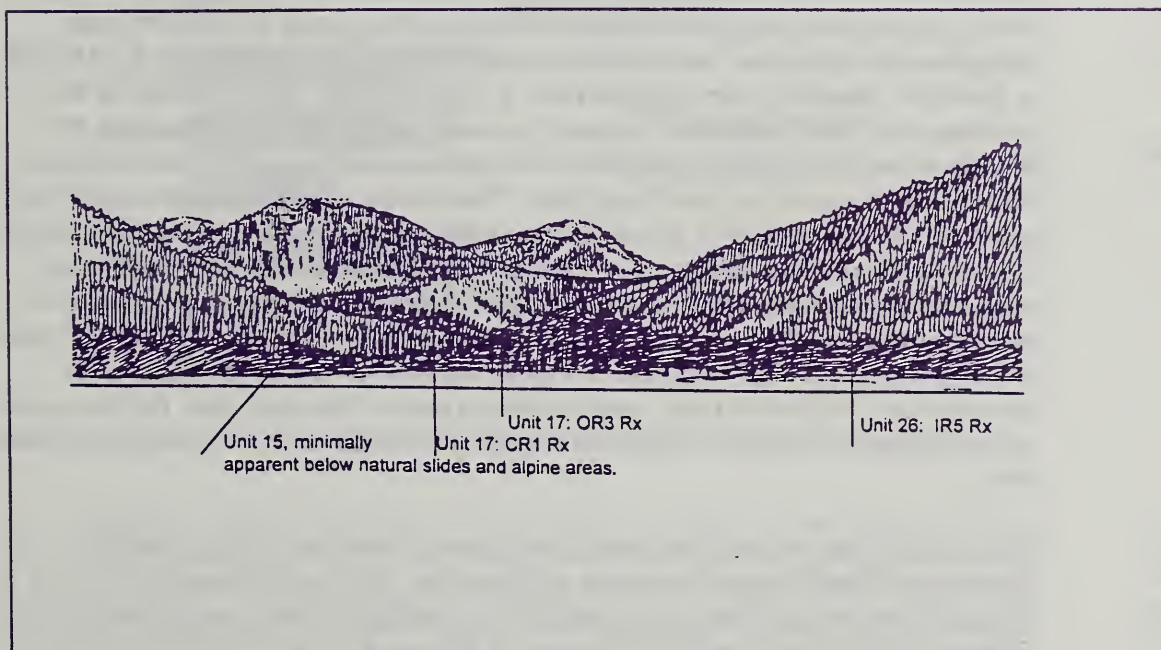
the background distance under this alternative. **Alternatives 1 and 4** do not propose harvest in the background but do propose harvest in the foreground and middleground of Red Mountain, south of the King George estuary. Unit 27 (only in Alt 1) and Unit 28 would be harvested using a combination of treatments that would leave between 50-70% of the trees in these units. These harvest units are expected to be unnoticeable to the casual marine traveler. However, there is some risk of blowdown with these partial cuts as discussed in previous sections. Under Alternatives 1, 3, and 4 the proposed harvest methods would minimize the apparent size and extent of any manipulations on the landscape.

*Alternatives 1, 3, and 4 have few effects on Stikine Strait views.*

Most of the effects to the Stikine Strait viewshed would occur by implementing **Alternatives 2 and 5**. Alternative 2 would harvest the north facing slope of King George Creek with road and a combination of cable and helicopter systems. All harvest units have been designed to blend in with the surrounding landscape by feathering the edges of cuts and designing the units to look like some of the surrounding landslides. Even with these measures, Units 25 and 26 are expected to be evident to the casual observer (especially Unit 26). In addition, both alternatives also harvest Unit 17 which will be seen in the background at the head of the King George valley. Alternative 5 would also harvest Unit 28 which is expected to be unnoticeable, but does carry some risk of blowdown. Both alternatives would also have the minor effects from roading discussed above.

*Alternatives 2 and 5 have the greatest effect on Stikine Strait mainly due to units 25 and 26.*

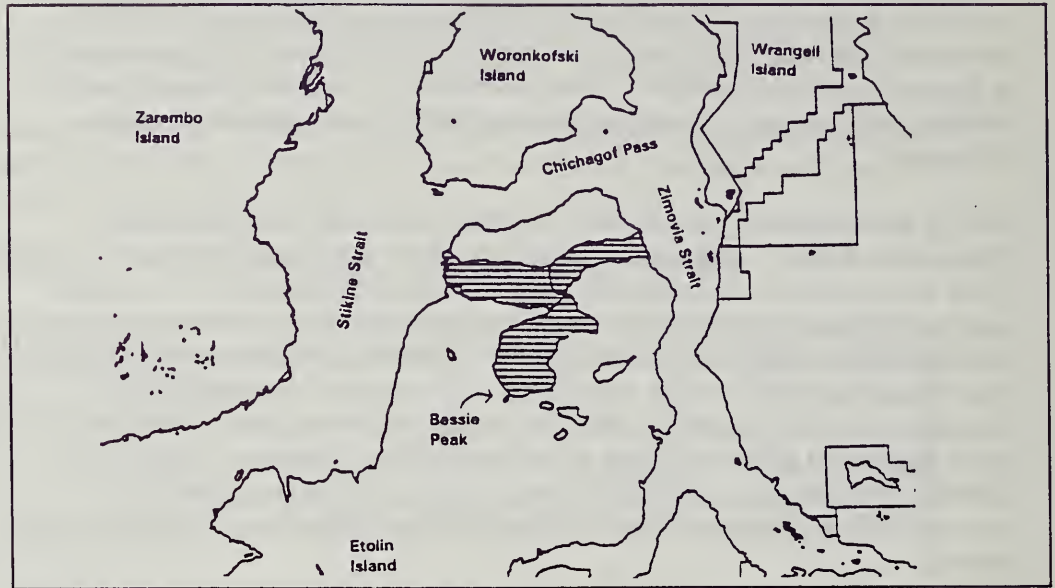
**Figure 3-7: Alternatives 2 and 5 (Proposed Action) as seen from King George Bay**



### 3 - Affected Environment and Environmental Effects

#### Bessie Peak Viewshed

Figure 3-8: Bessie Peak Viewshed



*Under action alternatives, views from Bessie Peak are somewhat mitigated by partial cuts and the shape of the harvest units.*

Bessie Peak is one of three peaks known as the 'Three Sisters' on the north end of Etolin Island. Bessie Peak, which lies furthest to the north of the group, is 3,915 feet high. Along the same ridge line, but further to the southeast, is Helen Peak which is 3,856 feet in elevation. The third sister, Virginia Peak, is 3,760 feet high and lies further to the southeast, just above Anita Bay. Currently, recreational use of areas inland from the beaches is low and focuses on a corridor to the alpine country including Red Mountain, Bessie Peak, Virginia Peak, and Helen Peak. These peaks have been used over the years as mountaineering objectives, as well as remote deer hunting areas. During the Wrangell District Recreation goal setting process and public comment on this timber sale, some suggested that further development of the Bessie Peak trail could occur in the future to make it more accessible to tourists, including the suggestion to create a high country trail and series of huts. Public comments indicated that some people do use this area for recreation and visit Bessie Peak, which overlooks much of the study area. For this reason, we have chosen to display the effects of the harvest alternatives to the views from Bessie Peak.

From Bessie Peak, one can look west to Red Mountain and Stikine Strait, north to Honeymoon Creek drainage, and south to Helen Peak. We have included Lower King George South Facing, Honeymoon South Facing, and Upper King George Land Units in this viewshed of approximately 6,000 acres, as they are the most visible land units to someone on Bessie Peak. The entire acreage of these land units is not visible, but the majority of the acres in these land units can be seen, therefore providing us with a relative indicator of the differences among alternatives.

### 3 - Affected Environment and Environmental Effects

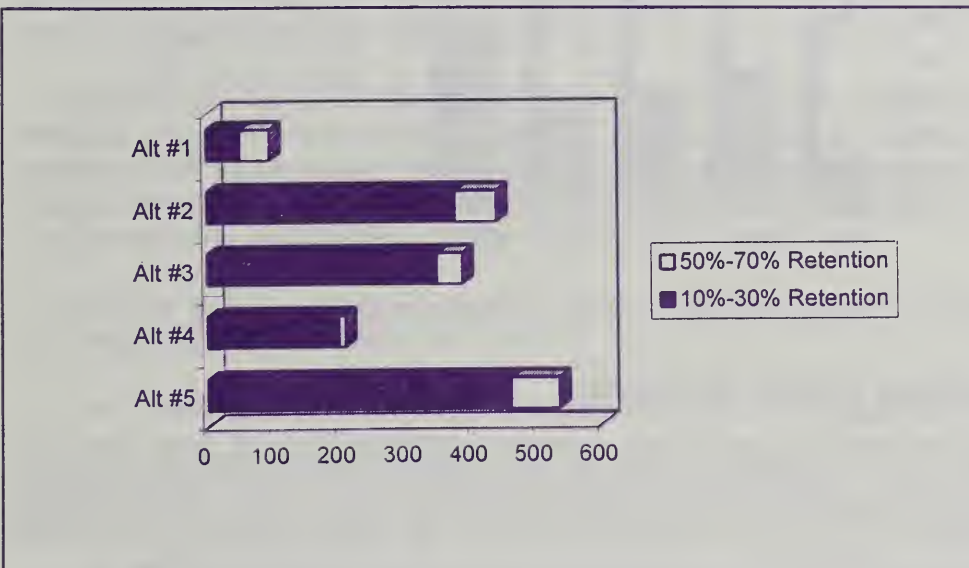
#### Bessie Peak Effects

Table 3-3 and Figure 3-9 illustrate the relative differences between the alternatives in relation to the view one might see from Bessie Peak.

Table 3-3: Acres Harvested in the Bessie Peak Viewshed

Trees Retained	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6
10% Trees Retained	45	291	292	133	330	0
30% Trees Retained	5	83	54	65	129	0
50% Trees Retained	29	64	39	9	73	0
70% Trees Retained	16	0	0	1	1	0
100% Trees Retained	5,845	5,502	5,555	5,732	5,407	5,940
% of Seen Acres Treated	2%	7%	6%	4%	9%	0%

Figure 3-9: Acres Harvested in the Bessie Peak Viewshed



**Alternatives 1 and 6** would have the least detrimental effect on views from Bessie Peak. No harvest units would be visible under Alternative 6 and less than 100 acres of harvest would be seen in the distance under Alternative 1. Unit 27 in Alternative 1 is located on the ridge that hikers use to access the peak but harvest along this access corridor would retain 70% of the trees and would open up some views of the surrounding landscape to hikers. This may have an overall positive effect as long as the route is kept free of logging slash. Both of these alternatives would maintain the natural condition of the Bessie viewshed.

*Of the action alternatives, Alternative 4 has the least effect on views from Bessie Peak.*

**Alternative 4** would not maintain the natural condition, but would have lower detrimental effects on views from Bessie Peak, compared to Alternatives 2, 3 and 5. Units 13, 14 and 15 and their associated roads would be most visible but are designed to mimic the shape of landslides and would be 3-4 miles away.

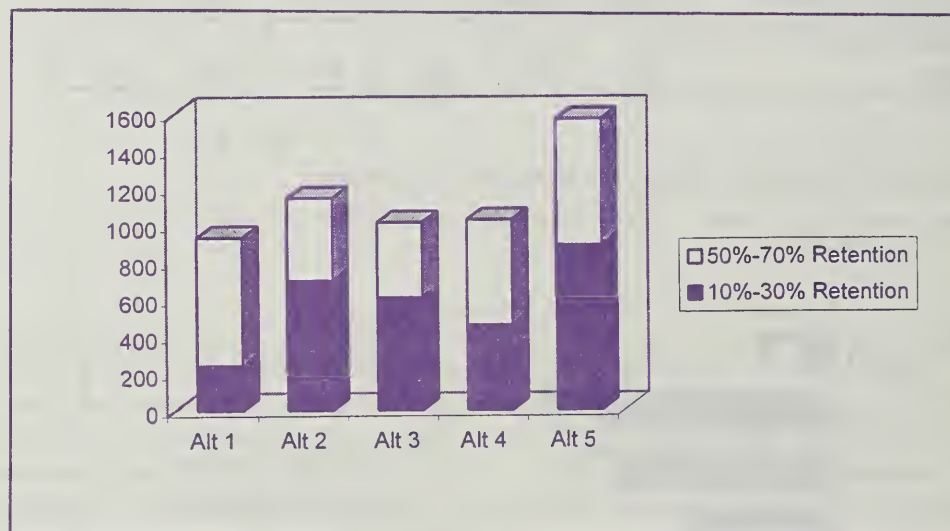
### 3 - Affected Environment and Environmental Effects

The rest of the alternatives have similar effect on views from Bessie Peak. In addition to harvest in Honeymoon Creek, **Alternative 3** would road and harvest Units 17 and 19-22 directly below Bessie Peak as close as 2 miles away. Most of these harvest units, except Unit 19, would be noticeable even though they are designed with irregular boundaries and leave 10-30% trees along the edges or as islands in harvest units.

*Alternatives 2 and 5 have the greatest effect due to units 17 through 22.*

**Alternatives 2 and 5** have similar effects. In addition to the harvest units mentioned above, both alternatives also harvest Unit 18. The top portion of this unit may be seen from Bessie Peak. These two alternatives also propose more roading and one additional rock pit that would be visible from the peak. Neither alternative proposes roading or harvest on the ridge used by hikers to access the peak.

**Figure 3-10: Visible Acres Harvested, Including All Four Viewsheds**



#### Cumulative Effects on Scenery

Cumulative effects must take into account past, proposed, and foreseeable future harvest of an area. The cumulative visual effects of the proposed King George timber sale differ, depending on where you are viewing the area from, and in what context (are you traveling on the ferry up Stikine Strait, or seeing the area from your living room window on Zimovia Highway?). From the Zimovia Strait Viewshed, this sale would add to the effects left from the Starfish Sale near Anita Bay, as well as those past harvest units on Wrangell Island. In only looking at the portion of the Zimovia Strait Viewshed which is viewed from Zimovia Highway, this sale would add to the visual effects left behind from beach logging on Etolin and Woronkofski Islands (depending on the alternative chosen). From the Chichagof Pass Viewshed, the only other evidence of harvest is on Woronkofski Island, though harvest units on Zarembo Island can be viewed far in the background on a clear day. The Stikine Strait Viewshed will be affected by adding to the effects of harvest from the Granite and Quiet timber sales (near the Big Bend area), as well as harvest units on Zarembo Island. From the Bessie Peak Viewshed, the cumulative visual effects will be limited to the activities proposed in the King George Study Area. There are no other timber sales proposed over the next ten years on the north end of Etolin Island. There are sales proposed over the next ten years south of Anita Bay but these sales would involve other viewsheds and travel routes.

### 3 - Affected Environment and Environmental Effects

#### Recreation Resources

Existing recreation use in the King George Study Area is very dispersed. A small amount of use occurs in association with alpine hiking, as people visiting the alpine country often access Bessie Peak by starting their hike at King George Bay. Due to the area's close proximity to Wrangell, many people use the beaches for picnicking and other day use activities, especially near the mouth of Honeymoon Creek and the King George Bay estuary. Most of the interior of the study area is seldom used.

Although use levels are low, results from public scoping indicate that many people are concerned with how timber harvesting may affect the area. In 1991, the Wrangell District initiated a broad public scoping effort to identify possible recreation developments. Results from that effort show that there is wide support for the development of a high country hiking trail with associated shelters or cabins on North Etolin Island. Additionally, public scoping associated with the King George Timber Sale resulted in many concerns for the recreation potential of this area. Examples of public response include:

*Most recreation takes place on the beaches, or from boating near King George Bay and Honeymoon Creek.*

*"...I feel the undeveloped recreational attractions of the area would best be maintained if no timber harvest was done in this study area. The King George area in particular is used by hikers, fishermen after both trout and salmon, people picnicking along beaches, hunters, as well as many other users of the area..."*

*"...with limited harvest this area will draw visitors who will spend dollars while visiting Wrangell, as well as to have marine transporters or guides take them to King George and trailhead (to the alpine country)...timber can be found in many places throughout the Tongass National Forest that have far less recreation opportunities to boast about. The King George area should be protected like the fine gem that it is..."*

*"...we believe the scope of logging planned is excessive and does not balance well against the recreational use of the area..."*

*"...North Etolin Island is one of the only remaining areas close to Wrangell that is, for the most part, uncut. It is an ideal area for recreation. King George and Honeymoon Creek provide excellent locations for camping, picnicking, hiking and fishing. I believe road building and logging will have a devastating effect on the area's recreational potential..."*

*"...we fully support a Forest Service project to build trails and cabins in the area, but a timber sale of the magnitude you're discussing would make a mess of the area and consequently any hope of developing the area for recreation or tourism..."*

*"...roads and clearcuts, even if they provide easier access to the higher country, must not be considered "access improvements." They are, rather, unfortunate eyesores one would end up having to go through in order to reach the good parts..."*

The public scoping effort also resulted in some comments in favor of the timber sale, including:

*"...the roads proposed would open more land for public recreation and the ability for the average family to access this area in terms of hunting, hiking and just general recreation..."*

### 3 - Affected Environment and Environmental Effects

*" I think it would be o.k. to leave the roads open after logging as they will never be tied to any main line systems..."*

*"...the area encompassing Red/Helen/Virginia/Bessie is the most outstanding alpine country outside Wilderness on the Wrangell District...this area is one of our prime opportunities for recreational developments for this type of activity. A road system could allow for an easier route to Bessie etc...."*

#### Other uses

Outfitter and guide use in the King George Study Area is low. There are currently 5 temporary permits for outfitting and guiding on Etolin Island including such uses as: big game hunting, sport fishing, sightseeing, hiking, and steelhead fishing. Although outfitters and guides are permitted to conduct these activities throughout Etolin Island, yearly reports from outfitters and guides indicate that the study area is not often used for commercial recreation activities.

#### Effects on Natural Setting

Any timber harvest in the area would change the character of this area for recreation. The natural setting is effected by the change in scenery in areas where people are accustomed to recreating. The alternatives differ in their degree of change. In general, any harvest in the interior of the study area (Alternatives 2, 3, 4 and 5) would change the experience for anyone hiking into the alpine country as views of the harvest units will detract from the natural landscape. Although the effects to scenery are important to the overall recreation experience, other important components include the social and managerial setting.

#### Effects on Social and Managerial Setting

*Recreational beach use at the mouth of the streams will not be affected.*

Recreational beach use at the mouth of Honeymoon and in the King George estuary will not be directly affected by this timber sale. Four alternatives (Alternatives 2, 3, 4 and 5) propose an LTF just north of the mouth of Honeymoon Creek. Although the anchorage there will not be improved, the LTF and associated road system may attract boaters.

*Roads will invite use. Closing roads to motorized use will favor hiking or biking.*

Roaded access will likely bring more people into the area, especially hunters. Those alternatives that allow access by motorized vehicles after the sale closes (Alternatives 2, 3, 4 and 5) would attract more use. Closing roads to motorized vehicles would be beneficial to those users seeking the improved access which roads provide without the chance of running into motorized recreational vehicles (people engaged in cross country skiing/mountain biking/hiking, etc.). Those alternatives that propose roads (Alternatives 2, 3, 4 and 5) could attract more use to the alpine area surrounding Bessie Peak by providing shorter access routes to that area. Table 3-4 displays the miles of road that would be built in each land unit, by alternative:

### 3 - Affected Environment and Environmental Effects

Table 3-4: Road Miles by Land Unit

	Honeymoon Land Unit	King George Land Unit	Zimovia Face Land Unit	Grand Total
Alt 1	0	0	0	0
Alt 2	3.75	7.05	0	10.80
Alt 3	3.51	4.16	0	7.67
Alt 4	4.12	0.73	0.43	5.28
Alt 5	4.12	6.25	0.43	10.80
Alt 6	0	0	0	0

Alternative 1 and Alternative 6 (No Action Alternative) are not likely to change the recreational use of the area. Alternative 1 would change the recreation experience for users viewing the area from the water or Wrangell Island, but does not propose to change the existing access to the study area.

#### Alternative 1

Alternative 1 proposes to harvest units on the exterior of the study area. No roads would be constructed in this alternative. Beach use around the study area should not be directly affected by this alternative. An LTF would not be built, so the potential to attract additional beach use in this area would not exist. Without roads, access to the area would not be improved, and thus would not change.

People recreating on the waters surrounding the study area and on Wrangell Island would have views of harvested units which may detract from their recreation experience. People accessing the alpine country would likely continue to use King George Bay as the primary starting point. If this alternative is chosen, hikers would traverse through Harvest Unit 27 to reach the peak. They would not likely be able to view harvest units from the top of Bessie Peak, or from much of the alpine ridge route to the peak.

#### Alternative 2

Alternative 2 proposes to harvest units along Chichagof Pass and in the interior of the study area. The road management strategy is to leave the main road open to motorized vehicle traffic from the LTF to Unit 17, then limiting access past that point to non-motorized vehicles. The LTF may attract additional saltwater related beach use of the area. Motorized access may attract the use of passenger vehicles or 4 wheelers, especially during the hunting season. Additionally, the LTF may become a drop-off point for hikers, cross country skiers or mountain bikers. People who want easier access to the area than currently exists, without interacting with motorized vehicles, would find that opportunity on the road system past Unit 17. People wishing to access the alpine country may find the motorized access to Unit 17, or the walk-in access to Unit 22, appealing as an easier "jumping off point" than currently exists.

People recreating on the waters north and west of the study area may be able to view harvest units which could detract from their recreation experience. People recreating on Wrangell Island would not be able to see harvest units except oblique views of Chichagof Face. People accessing the alpine country would see harvest units from Bessie Peak, as well as from many points on their trip to the top.

## 3 - Affected Environment and Environmental Effects

### Alternative 3

*Alternative 3 provides the most opportunity for motorized recreation use.*

Alternative 3 proposes harvest units on the exterior of the study area facing Chichagof Pass and a small amount of harvest facing Wrangell Island (Unit 6). The interior of the study area would contain harvest units, as well. The road management strategy for this alternative would provide motorized access from the LTF to Unit 20. This alternative provides the most opportunity for motorized recreation use and may attract passenger vehicle and 4 wheeler traffic, especially during the hunting season. Drop-off recreation use by mountain bikers, cross country skiers, hikers, and other non-motorized recreationists may become established. However, the potential of interaction between non-motorized and motorized vehicle users can be expected. People wishing to access the alpine may find motorized access to Unit 17 and walk-in access to Unit 22 appealing.

Recreationists on the waters north and east of the study area may have views of harvest units which may detract from their recreation experience. People recreating on the waters near King George Bay would only see Unit 1. As there is no harvest proposed in the Lower King George or Red Mountain Land Units, views of those areas would not be affected. People accessing the alpine country would view harvest units both from the peak and along the trip to the top.

### Alternative 4

*Alternative 4 would provide for motorized access to Honeymoon Pass.*

Alternative 4 proposes harvest units along the exterior of the study area and in the Honeymoon Land Unit. The road management strategy for this alternative is to leave the road open to motorized vehicle traffic, but proposes the shortest amount of road to be constructed (of the roaded alternatives). The LTF may attract additional beach/saltwater use to that area, and may encourage drop-off use of motorized and non-motorized vehicles for recreational use. People wishing to access the alpine country would likely continue to use King George Bay as a "jumping off point," but may be attracted to the road system as an easier starting point, just past Unit 15.

People recreating on the waters surrounding the study area would have views of harvest areas from the west, north and east which may detract from their recreation experience. People accessing the alpine country would have limited, oblique views of harvest units from the top, and would view some evidence of harvest along the way up if they choose to use the road system as a starting point.

#### Alternative 5

Alternative 5 (the Proposed Action for timber harvesting) would result in logging both the outside and interior of the study area. The road management strategy is to leave the main road open to motorized vehicle traffic from the LTF to Unit 17, then limit access past that point to non-motorized vehicles. The LTF may attract additional saltwater related beach use of the area. Motorized access may attract the use of passenger vehicles or 4 wheelers, especially during the hunting season. Additionally, the LTF may become a drop-off point for hikers, cross country skiers or mountain bikers. People who want easier access to the area than currently exists, without interacting with motorized vehicles, would find that opportunity on the road system past Unit 17. People wishing to access the alpine country may find the motorized access to Unit 17, or the walk-in access to Unit 22, appealing as an easier "jumping off point" than currently exists.

People recreating on the waters surrounding the study area or on Wrangell Island would be able to view harvested areas, which may detract from their recreation experience. Likewise, people hiking in the Bessie Peak area would view harvested units throughout most of their hike to the top as well as once they reach the summit.

#### Alternative 6

Alternative 6 (the No Action Alternative) proposes to leave the study area in its current condition. Access would not be improved, and recreation values as they exist now would be maintained. People recreating on the waters surrounding the study area and on Wrangell Island would not view harvest units in this area. This alternative would likely be appealing to those supporting the use of the King George as an undeveloped recreation attraction close to Wrangell. The alpine country is the largest potential 'drawing card' for this area. Leaving the area as it is would allow for the future development of the often mentioned high country trail or hut-to-hut system. Under this alternative, the trail and hut-to-hut system could pass through and offer views of undeveloped country.

#### Cumulative Effects on Recreation Resources

There are no other timber sales proposed over the next ten years on the north end of Etolin Island. The potential King George Sale and the past harvest in Anita Bay and Quiet Harbor are the only sales in this area and there are no other planned actions which would have a detrimental effect to recreation resources. There are sales proposed over the next ten years south of Anita Bay but these sales would involve other recreation areas and travel routes. Therefore, the effects disclosed by the previous section encompass all past and reasonably foreseeable effects to recreation resources on North Etolin Island.

## Issue Two: Timber Sale Economics and Road Management

*"Please expedite this sale and select the alternative which provides the greatest volume of timber. Our timber industry and the economy of our district depends on sales such as this one in the King George area."*

*"We need to learn more about how small and large operators work. Why do you plan for future entries...?"*

*"I would like to propose that you address the issue of the value of jobs and economic stability for the people of Wrangell and Southeast Alaska. While I'm sure we would all agree that scenic and recreational values are important to people, we would also have to agree that without jobs and economic stability, the same people will not be able to enjoy the other values the King George area has to offer."*

*"This sale should not be characterized as being of economic benefit to Wrangell when the likelihood is that it will be left with 1,200 acres of harvested forest on its front doorstep and very little else to show for it."*

*"The planning for this sale has suggested new approaches to timber harvest that are very encouraging from a wildlife manager's point of view. We hope that in the end, these new approaches will be adopted and that the project decision will be based on more than the timber target or the economic bottom line."*

*"The roads proposed would open more land for public recreation and the ability of the average family to access this area for hunting, hiking and just general recreation."*

*"Road access is detrimental to wolves, bears and marten. Roads need to be closed after logging. If roads must remain in service, then use of them needs to be restricted to mitigate adverse effects on wildlife."*

*One of the key issues is how much we should harvest now, versus save for the future.*

The above comments reflect the range of opinions on the factors affecting sale economics and its relative importance when compared to other issues. We have responded to the above concerns by designing a range of alternatives which are all economically feasible, yet responsive to environmental issues (Alternative 2 can be made feasible if the road is constructed on the north side). The short-term economics of getting the timber out is different than the long-term economics of a sustained harvest level and greatest efficiency over time. Even though we are making a short-term decision, the first harvest entry must be responsive to long-term needs and issues. The biggest tradeoff between alternatives is the rate of harvest over time compared to the cost and value of the transportation system (roads, helicopters and log transfer site). Alternative 5 would log most of the accessible and economic areas in the project area in the next 5 years but must also support the greatest amount of roading to do so. Maintaining this road over time, without income from future sales would be difficult. At the other end of the spectrum, Alternative 1 harvests with a helicopter, constructs no roads and is the least cost to implement. This alternative forgoes development of a transportation system and this will affect the feasibility of possible future small or large sales. By concentrating harvest in different areas, the other alternatives leave some areas available for the future, while developing some of the infrastructure. Thus, the range of alternatives illustrates the biggest issue surrounding harvest economics in the King George area; If we log, how much should we take now versus save for the future?.

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Also discussed in this section, are the issues surrounding regional and local economic benefits and the cost or benefits of closing roads or keeping them open.

#### Regional and Local Economic Benefits

The communities of Southeast Alaska depend on the Tongass National Forest to provide the foundation for one or more natural resource based industries including: wood products, commercial fishing and fish processing, tourism and commercial recreation, mining, and mineral development. Many residents also depend heavily on subsistence hunting and fishing to meet their basic needs. Government, transportation service and educational services are also significant regional income sources.

**Table 3-5. Southeast Alaska Wage and Salary Employment 1994 and 1996 Forecast**  
Annual Average Employment

	1994	1996	Gain/Loss
<b>Goods Producing</b>	<b>5,850</b>	<b>5,550</b>	<b>-300</b>
Mining	150	225	+75
Construction	1,550	1,525	-25
Manufacturing	4,150	3,800	-350
Seafood Processing	(1,650)	(1,525)	(-125)
Forest Products	(2,200)	(1,950)	(-250)
<b>Service Producing</b>	<b>29,400</b>	<b>30,000</b>	<b>+600</b>
Transportation	2,900	2,975	+75
Trade	6,550	6,750	+200
Wholesale	(550)	(550)	(0)
Retail	(6,000)	(6,200)	(+200)
Finance, Insurance, Real Estate	1,450	1,600	+150
Services and Misc.	6,200	6,575	+375
Government	12,300	12,100	-200
Federal	(2,000)	(1,950)	(-50)
State	(5,350)	(5,250)	(-100)
Local	(4,950)	(4,900)	(-50)
<b>Total</b>	<b>35,250</b>	<b>35,550</b>	<b>+300</b>

*Source: Alaska Economic Trends, Alaska Department of Labor, May 1995.*

A mixture of employment growth and decline is projected for Southeast Alaska. Gains are expected in the mining industry following the reopening of the Greens Creek mine on Admiralty Island and construction employment is expected to increase in response to a number of residential and public works projects. The number of visitors to Southeast Alaska continues to increase, resulting in increased employment in the services and retail trade sectors. The gains in these industries are expected to be tempered by the effects of the Wrangell mill closure and reduced logging activity. Decreasing budgets are expected to lead to job cuts in the government sector. A new individual fishing quota system for some species is expected to reduce the number of seasonal and short term processing and fishing crew positions.

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The wood products industry has been an integral part of the regional economy of Southeast Alaska since the 1950's. From 1981 through 1994, the industry provided direct employment to an average of 2,704 workers, and indirect jobs for an additional 1,890 people. Recent employment in the timber industry of Southeast Alaska for 1987-1994 is listed below in Table 3-6.

**Table 3-6. Jobs Produced in the Timber Industry Since 1987**

Type of Jobs	1987	1988	1989	1990	1991	1992	1993	1994	Jobs/MMBF
Logging	1,545	1,981	2,113	2,144	1,554	1,415	1,344	1,177	2.30
Sawmill	375	468	478	500	604	538	447	515	1.01
Pulpmill	861	892	925	899	911	910	859	533	1.04
Direct	2,781	3,341	3,516	3,543	3,069	2,863	2,650	2,225	4.35
Indirect	1,950	2,350	2,550	2,570	2,226	2,077	1,935	1,624	3.18
Total	4,731	5,691	6,066	6,113	5,295	4,940	4,585	3,849	7.53

*Source: Timber Supply and Demand 1994, USDA Forest Service, March 1995.*

The annual demand for timber in Southeast Alaska is determined by the cost of timber offered for sale, the number and capacity of wood processors in operation, the market value of the products manufactured, the competitive position of Alaska's producers in world markets, and the currency exchange rate with wood importing nations.

Wood products manufacturers operating in Southeast Alaska in 1994 had an installed mill capacity to process approximately 519 MMBF. Total wood consumption was 359 MMBF in 1994.

Despite record lumber prices in 1994, Alaska Pulp Corporation closed its Wrangell sawmill indefinitely on December 1, 1994. The sawmill, with an installed capacity of 110 MMBF per year, was operating at approximately 69% of capacity prior to shutdown. Although APC has offered to sell the mill, at least one prospective purchaser has declined to purchase it, citing the lack of certainty in Tongass timber supply as one of the reasons.

There are essentially three sources of timber for processors in Southeast Alaska: 1) the Tongass National Forest, 2) Native-owned timberlands, and 3) State timberlands. Import of Canadian logs has declined to near zero for the past several years due to reduced supply and rising selling values for Canadian pulp logs.

The State's timber program in Southeast is relatively small, with an average annual harvest of 9 MMBF over the past five years, with a high of 21 MMBF in 1994. Harvest from Native timberland peaked in 1989 at 532 MMBF, declining to 215 MMBF in 1994. Timber harvest from the Tongass reached its peak in 1990 at 461 MMBF, declining to a 10 year low of 276 MMBF in 1994. Harvest on all ownerships in Southeast Alaska for 1994 was 511 MMBF. (Timber Supply and Demand 1994.) Currently, in-State processing restrictions only apply to timber harvested from federal lands. Because export market prices greatly exceed those paid by local manufacturers, all but the lowest quality Private and State timber is sold overseas. Thus the bulk of the wood actually processed in Southeast Alaska comes from the Tongass National Forest.

The King George Study Area will not produce enough timber volume by itself to encourage investment in new facilities, or re-opening of the Wrangell sawmill. However it plays a role as part of the overall Tongass National Forest sale offering for fiscal year 1996 in helping meet in-State processing demands and retain existing employment levels.

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Temporary jobs in the Wrangell area as a result of this sale range from 32-60, in potential direct jobs from logging during the life of the sale lasting from 2-5 years. Some of the loggers could be Wrangell residents. Depending on the sale offered, and the purchaser who bids the highest price, some of the logs could be processed in Wrangell, increasing the potential number of jobs. However, hiring practices and processing location is not something we can control.

*Temporary jobs available in the Wrangell area could range from 32-60 as a result of this sale.*

#### Market Values and Costs of Each Alternative

Economic analysis is useful in comparing the economic efficiency of alternatives in the King George timber sale. The economic analysis will provide needed information to make informed economic decisions in implementing the Forest Plan. Current Forest Service Handbook direction (USDA FSH 2409.18) recommends a mid-market assessment to compare benefits and costs of proposed timber sale project alternatives. Determining if King George will be an economical offering was analyzed by subtracting road construction, transportation costs and logging costs, from the log value for each alternative. Because of the different management prescriptions, species mixes, volume per acre, mobilization costs and harvest methods, the log selling value will vary for each alternative. This analysis will use a ten year average for end product selling values (adjusted for inflation) to account for market fluctuations. The results of the mid-market assessment and relative economic ranking of each alternative are displayed in Table 3-7. Results from the mid-market analysis are used as a comparison of the alternatives to evaluate cost differences. Since the timber market has been changing rapidly as of late, the actual stumpage rate may change by the time the timber sale appraisal is completed. The final appraisal will include current quarter selling values, cost information, and a normal profit and risk margin using an operation of average efficiency.

**Table 3-7 . Economic Comparisons of Timber Values to an Operator of Average Efficiency**

Economic Factor	Alt 1	Alt 2	Alt 2 North Road	Alt 3	Alt 4	Alt 5	Alt 6
Total Volume (MBF)	14,060	19,500	19,500	16,700	16,170	26,840	0
Selling Value (\$/MBF)	\$371	\$372	\$372	\$372	\$371	\$373	\$0
<b>Cost (\$/MBF)</b>							
Stump to Truck.....	\$226	\$168	\$168	\$172	\$191	\$184	\$0
Transportation.....	55	47	47	46	48	46	0
General Logging Overhead.....	11	11	11	11	11	11	0
Temporary Development.....	4	7	7	9	6	6	0
Specified Road Cost.....	0	96	91	75	56	68	0
Logging Profit and Risk (60%) .....	52	46	47	47	48	48	0
<b>Total Costs</b>	<b>\$348</b>	<b>\$375</b>	<b>\$371</b>	<b>\$360</b>	<b>\$360</b>	<b>\$363</b>	<b>\$0</b>
<b>Net Stumpage (\$/MBF)</b>	<b>\$23</b>	<b>-\$3</b>	<b>\$1</b>	<b>\$12</b>	<b>\$11</b>	<b>\$10</b>	<b>\$0</b>

Volume estimates included in each alternative include utility and road right-of-way, which will be cut during road construction for the roaded alternatives. Positive net

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stumpage values generally indicate a viable alternative. Stumpage values are approximations based on middle market analysis and not current or future values. The middle market analysis indicates that **Alternative 2** may be an uneconomic offering under the criteria used. The primary reason for this is the higher specified road cost associated with constructing the mainline road on the south side of the Honeymoon drainage, which is located primarily through open muskeg. While there would be a reduced cost for felling right-of-way timber for this road location, the increased cost of extra rock can raise the cost of building on muskeg by 25%. Locating the mainline road system on the north side of Honeymoon creek would reduce the specified road construction costs per MBF significantly. The result would be a positive net stumpage value of \$1. The road on the south side was considered in the range of alternatives because of the potential values to freshwater systems (Issue 3) and habitat conservation (Issue 4).

*The net, mid-market stumpage value is greatest for Alternative 1.*

The net stumpage value is highest for **Alternative 1**. While the logging costs for this helicopter alternative are substantially higher than other alternatives, the lack of specified road development is the largest contributing factor to the high positive midmarket stumpage. **Alternatives 3, 4 and 5** have similar net stumpage values but different means of arriving at near the same value. Alternative 3 is middle of the road for almost all cost centers, while Alternative 4 has the second highest logging costs of all alternatives (due to substantial proportion of helicopter volume) coupled with the lowest specified road costs of the roaded alternatives. Changes made in **Alternative 5** between the DEIS and FEIS increased the logging costs overall because there is greater dependence on the helicopter.

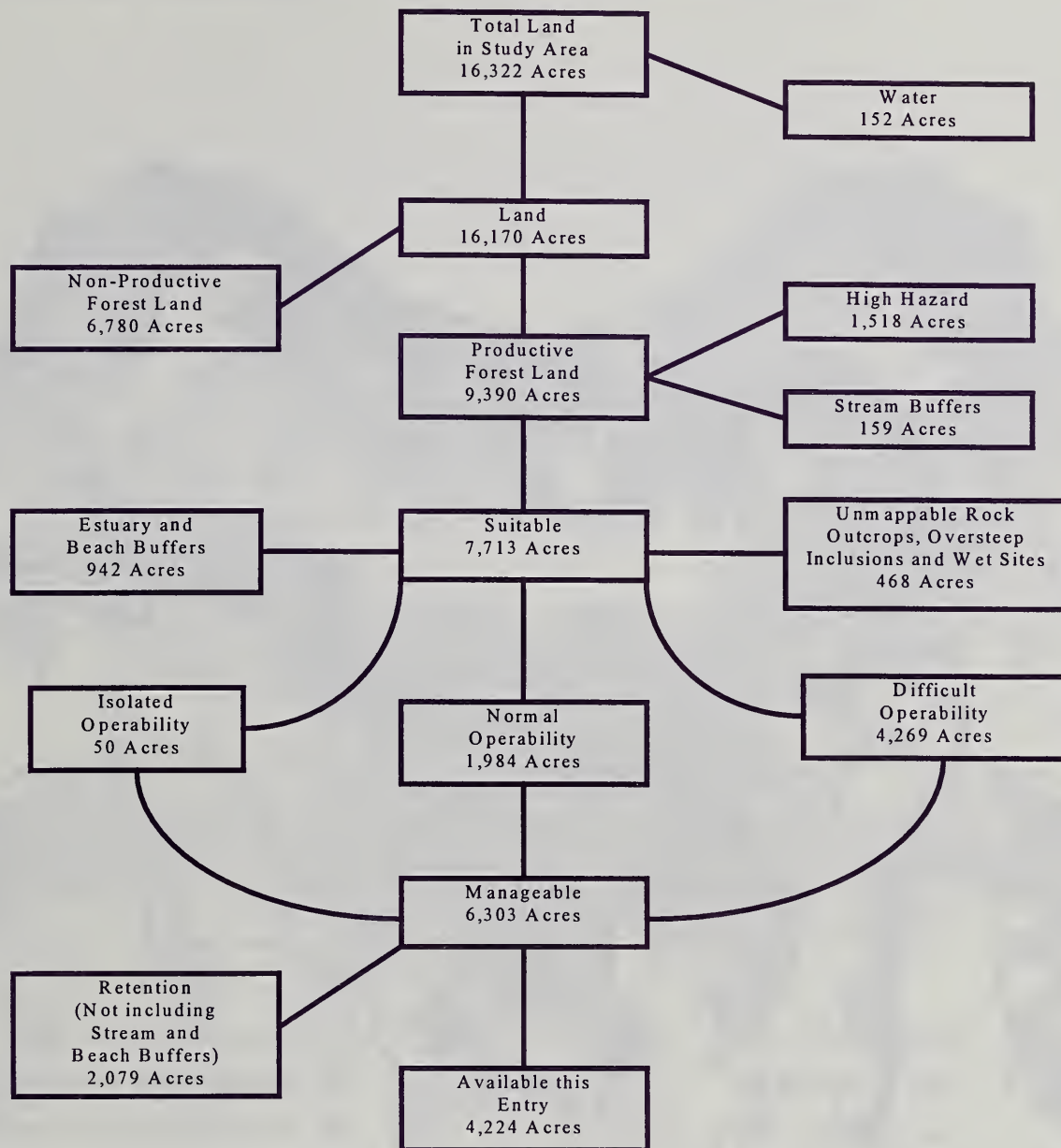
**Table 3-8. Alternative Summary for the King George Study Area**

	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6 No Action
<b>Timber Harvest</b>						
Manageable Acres Available	4224	4224	4224	4224	4224	4224
Proposed Treatment Acres	888	968	894	943	1393	0
% of Manageable Treated	21%	23%	21%	22%	33%	0%
<b>Harvest Volume (MBF)</b>						
Cable Volume	0	9,300	7,450	4,040	8,650	0
Helicopter Volume	<u>14,060</u>	<u>10,200</u>	<u>9,250</u>	<u>12,130</u>	<u>18,190</u>	<u>0</u>
Total Volume	14,060	19,500	16,700	16,170	26,840	0
<b>Road Construction Miles</b>						
Specified Road	0	9.8	6.6	4.8	9.6	0
Spur Road	<u>0</u>	<u>1.0</u>	<u>1.1</u>	<u>.5</u>	<u>1.2</u>	<u>0</u>
Total Road Miles	0	10.8	7.7	5.3	10.8	0

Figure 3-11 shows the various classifications of land within the project area. After various types of exclusions, there are over 4,200 acres of land available for harvest this entry. This is less than 1/2 of the total Productive Forest Land (> Volume Class 4). The numbers in Figure 3-11 were derived from existing inventories which were modified by extensive field reconnaissance and stand exams. We are therefore confident that the numbers reflect the existing ground conditions.

### 3 - Affected Environment and Environmental Effects

Figure 3-11, Acreage Classification for the King George Study Area



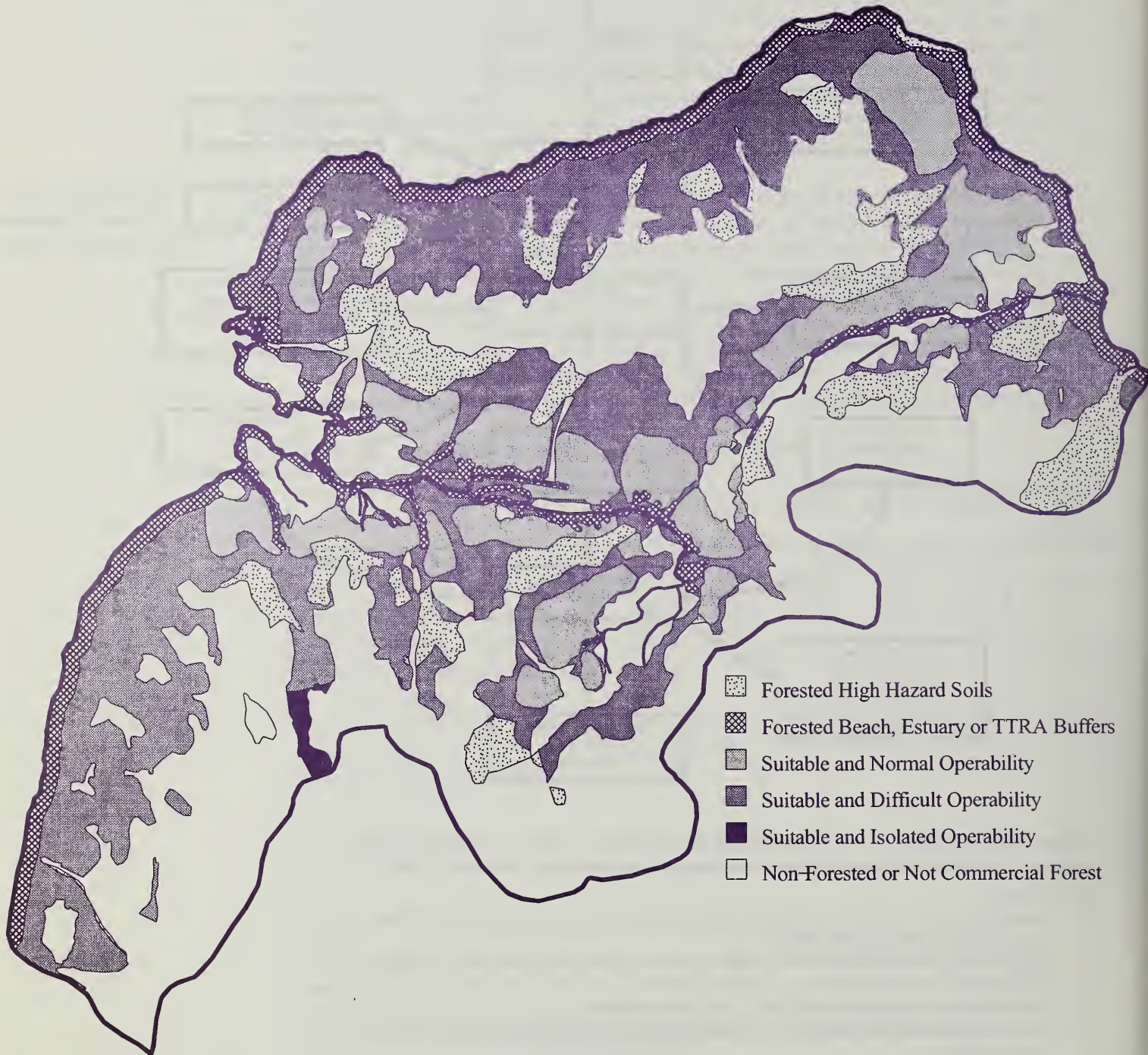
There are approximately 16,322 acres within the study area. Of this, 152 acres are water, estuaries, or tide flats. Most of the acreage computations are based on the remaining 16,170 acres.

- Non-productive forest land includes areas of bare rock, alpine meadows, muskeg wetlands and soils that only support scrub timber
- High hazard soils are areas that pose a high risk of mass failure due to steep slope, soil type, drainage ability or other factors.
- Stream buffers are required on all Class I and Class II streams.
- Current management direction on the Tongass requires a 500 foot beach buffer and 1000 foot estuary buffer.

The suitable acres have been pared down to what we call manageable acres, which accounts for unmappable rock outcrops, inclusions of oversteepened slopes, and poorly drained sites within larger stands.

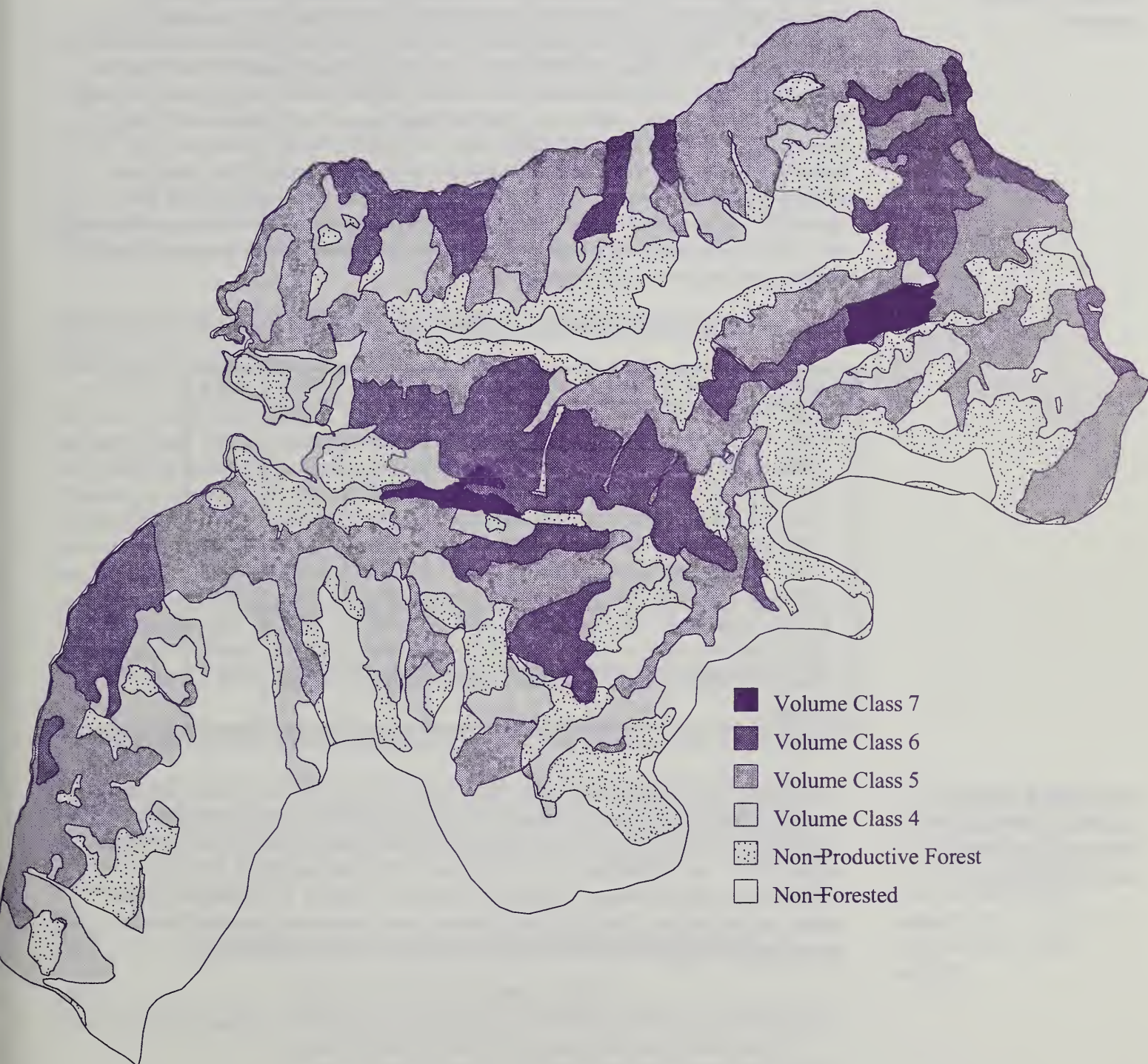
### 3 - Affected Environment and Environmental Effects

Figure 3-12, Suitability and Operability



### 3 - Affected Environment and Environmental Effects

Figure 3-13, Timber Volume Classes



### 3 - Affected Environment and Environmental Effects

#### Capability to Offer Small and Large Sales

*Alternatives 1 and 6 offer no potential volume to smaller operators.*

The Forest Supervisor will decide which alternative to implement given the environmental effects disclosed in this document. Deciding how many sales to sell from a given alternative is an administrative decision made after an alternative is selected. However, due to the interest in this issue, we have disclosed the inherent potential of each alternative to be divided among large and small sales in the next 5 years. A small sale is considered to be less than 1 MMBF in size. Smaller operators generally favor harvest with simple cable, or ground-based systems easily logged from existing roads often built by larger sales. Several cable units within the King George study area are well suited for potential offer as small sales, including units 6, 10, 11, 12, 15, 20, 23 and 24. The following table shows which potential small sale units are included in the analysis for each alternative and could be directly accessed by the road system planned for that alternative. Alternative 1 would not offer easily accessed volume to smaller operators and would not access future sales because it builds no road. Alternative 6 does not offer any volume to either large or small operators.

**Table 3-9. Potential for Small Sales Offer by Alternative**

Unit	Acres	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6
6	32	No	No	Yes	Yes	Yes	No
10	17	No	No	No	Yes	Yes	No
11	7	No	No	Yes	Yes	*	No
12	6	No	No	Yes	Yes	*	No
15	14	No	Yes	Yes	Yes	Yes	No
20	16	No	Yes	Yes	No	Yes	No
23	19	No	Yes	No	No	Yes	No
24	11	No	Yes	No	No	Yes	No
<b>Total Area</b>	<i>Acres</i>	<b>0</b>	<b>60</b>	<b>75</b>	<b>76</b>	<b>124</b>	<b>0</b>
<b>Total Volume</b>	<i>MBF</i>	<b>0</b>	<b>1,590</b>	<b>2,007</b>	<b>2,177</b>	<b>3,800</b>	<b>0</b>

\* Units 10-12 were combined and the harvest prescription modified under Alternative 5.

*Alternative 5 has the greatest potential to be divided among large and small operators.*

In addition to the potential small sales listed above, the road system established for each alternative would access various areas of commercial forest land for possible future small or large sales. Such sales would require further environmental analysis and disclosure under NEPA. The information is provided here so that you can see the relative differences in each alternative's ability to access future timber by developing a road system under this sale. The following table compares the acres of suitable forest land that would have access improved by the road system built for each alternative.

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**Table 3-10. Forested Acres With Access Improved by Roading Under Each Alternative**

	Improved Normal Operability Access	Improved Difficult Operability Access	Improved Access Acres Available	Total Improved Acres Harvested	Improved Access Acres Remaining
Alt 1	0	0	0	0	0
Alt 2	805	1,483	2,283	553	1,730
Alt 2 (N.Road)	932	1,561	2,493	553	1,940
Alt 3	718	953	1,671	453	1,218
Alt 4	440	709	1,149	273	876
Alt 5	1,296	1,770	3,066	756	2,310
Alt 6	0	0	0	0	0

### Market and Non-Market Benefits of Maintaining or Closing Proposed Roads

The above table displays the possible future benefits of road construction. Maintaining this road system for motorized use after the sale is logged has both economic and environmental costs. If the road is going to be used again in the near future, the benefits of keeping it open may be high. Even if a road is closed, some roads will need to be maintained to some degree in order to keep culverts functioning so that blockages do not occur that would result in washouts and sedimentation problems. Some road closures may have benefits to people who prefer non-motorized recreation but can still take advantage of improved access. Some of the greatest benefits of road closures can be to wildlife, since hunting success and disturbance is generally less. The tables below summarize the tradeoffs of various portions of road proposed under each alternative. More information about each segment is available on the road cards in Appendix B.

#### Honeymoon North Road (Segments 1 and 2)

Road segments 1 and 2 make up the backbone of the road network for most alternatives, starting from the log transfer site north of Honeymoon Creek and extending to the pass that separates the King George Creek watershed from the Honeymoon Creek watershed. **Alternatives 3, 4 & 5** keep the road open to potential users. **Alternatives 1 and 6** would not construct this segment.

*Benefits of keeping the Honeymoon road open include access for recreation, small sales, and stream crossing maintenance. Restricting access would benefit wildlife.*

**Table 3-11: Effects of Road Development and Maintenance, Segments 1 and 2**

Issue	Effects of Road Segments 1 & 2
Scenic and Recreation	Provides improved access for hiking, biking, or motorized use to the central portions of the study area, including partial access to the pass to Kunk Lake. Keeping it open would favor motorized use while motorized closure would benefit hikers and bikers.
Economics	Provides the mainline road through Honeymoon Creek which is required to economically harvest timber in the interior of the study area. Keeping the road open would help reduce costs of possible future management activities.

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Freshwater System	Crosses extreme upper limit of Class II habitat at two sites. Crosses several Class III streams that pose a moderate risk of debris accumulation in culverts which may lead to wash-outs. Oversizing culverts and regular maintenance will minimize risk.
Habitat Conservation	Bisects areas of old growth habitat and minimizes habitat effectiveness of the surrounding forest. Improved access may increase harvest of some game species and furbearers in central portion of the study area. Restricting access to walk-in travel would benefit habitat values. Road ends at the Honeymoon pass which is a constricted wildlife corridor.
Cost of Maintenance	If the road were kept open to motorized use, the cost of maintenance is \$8,232/year. If closed to motorized use, the cost of maintenance is \$1,163/per year.

#### Zimovia Face Road (Segment 3)

*If constructed, there are few benefits to keeping the Zimovia road open for access.*

This segment crosses the Zimovia Face land unit. **Alternative 3** would only build the first 1/2 mile of this road, **Alternatives 4 and 5** would build the first 3/4 of a mile. These three alternatives would block motorized access to the road following harvest. to reduce visual and wildlife habitat impacts. There are no major drainage structures within this segment. Periodic hand maintenance should be effective in reducing possible risk of drainage structure failure. **Alternatives 1, 2 & 6** would not construct this segment.

Table 3-12: Effects of Road Development and Maintenance, Segment 3

Issue	Effects of Road Segment 3
Scenic and Recreation	Parts of the road that pass through harvest units are visible from Wrangell Island and Zimovia Strait. The road may provide some access for hiking, biking, or motorized use but there is little recreation attraction other than dispersed hunting.
Economics	Access roads across Zimovia face would be needed in order to use conventional cable systems to more economically harvest all manageable timber. There are also areas that can only or best be harvested with a helicopter. Construction of the first 3/4 mile could provide a landing area that could benefit helicopter harvest. Keeping the road open to vehicle access would provide minimal benefits to future management activities.
Freshwater System	Most of the road does not affect the freshwater system. A few Class III streams crossings pose a slight risk of debris blockage in culverts. Oversize culverts and periodic hand maintenance will reduce this risk

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<b>Habitat Conservation</b>	Improved access may increase harvest of some game species and furbearers in this fairly high to medium value ungulate winter range. Restricting access to walk-in travel would benefit habitat values.
<b>Cost of Maintenance</b>	Under Alternatives 3, 4 & 5 maintenance of 1/2-3/4 miles of this road would cost \$150/year (compared to \$2000/year to keep it open).

#### Honeymoon Pass to King George Creek (Segment 4)

This road segment extends from the pass dividing Honeymoon and King George Creeks across upper King George Creek. It crosses two v-notches that flow into King George Creek. **Alternatives 2, 3 & 5** would build the entire 1.3 miles of this road. **Alternative 2 and 5** would keep the road open to vehicle access and erect a gate just past Unit 17. The road beyond the gate will be accessed only for intermittent maintenance, administrative activities or small sales. This will maintain routine access to culverts and bridges but limit access into King George drainage in response to wildlife habitat and conservation issues. **Alternative 3** would keep the entire segment open to motorized users. **Alternatives 1, 4 & 6** would not build this segment.

*Benefits to keeping this segment of road open include providing access to maintain stream crossings. Restricting access would benefit wildlife near King George Creek.*

**Table 3-13: Effects of Road Development and Maintenance, Segment 4**

<b>Issue</b>	<b>Effects of Road Segment 4</b>
<b>Scenic and Recreation</b>	Portions of this road that cross unit 17 would be seen in the background from Stikine Strait. The road would provide access to hikers, bikers and motorized use across King George Creek and into the upper basin. If closed to motorized use, the road would provide walk-in access for fishing.
<b>Economics</b>	Keeping the road open would provide access for future management and possible small sales. Bridge or culvert removal would ensure closure but be expensive to remove and re-establish for future management (particularly a bridge). If future management is not anticipated, removal of structures might reduce maintenance costs over time.
<b>Freshwater System</b>	Segment 4 crosses King George Creek with a bridge. This segment also crosses two Class III streams with moderate to high risk of failure due to debris loads. Stream crossing structures have been designed to reduce this risk. Keeping the road open to these structures will benefit access for maintenance.
<b>Habitat Conservation</b>	This road segment crosses into the King George watershed which contains most of the retained old growth designated under this project. Wildlife values are higher in this watershed than the Honeymoon watershed. The pass that this road goes through was identified in Issue 4 as a 'pinch point' in an important travel corridor. Thus, restricting access to walk-in use would benefit wildlife conservation values.
<b>Cost of Maintenance</b>	The cost of keeping the road open to motorized travel is \$3,872/year compared to a cost of \$494/year to close the road to motorized traffic.

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#### Access to Unit 18 (Segment 5)

*If constructed, there are few benefits to keeping Segment 5 open.*

This segment of road is 1/2 mile long and accesses Unit 18 under **Alternative 2**. Under this alternative the road would be maintained for 5 years after harvest and then closed to all motorized traffic to reduce access to the south facing slope in King George watershed and reduce risks to the freshwater system by removing culverts from the stream on the east end of Unit 18. **Alternatives 1, 3, 4, 5, and 6** would not construct this segment.

**Table 3-14: Effects of Road Development and Maintenance, Segment 5**

Issue	Effects of Road Segment 5
Scenic and Recreation	This road would provide limited additional access for hiking, biking or motorized use except for general hunting. The road segment is seen from Bessie Peak.
Economics	This road provides access to cable log the east side of Unit 18 and provides a landing to helicopter the west side of the unit. Keeping the road open would have minor benefits to future planting and thinning activities (walk-in access would still be relatively easy). Closing the road after 5 years may provide the opportunity to salvage any blowdown that might occur.
Freshwater System	This segment crosses one Class III stream on the east side of the unit. The size of alder trees present within the stream zone indicates mass movement within the past 80 years. Oversize culverts and periodic maintenance may reduce the risk of road washout. Since further road extension is not anticipated, removal of the culvert is recommended.
Habitat Conservation	Improved access to the south-facing slope of the King George watershed may increase hunting pressure and reduce the effectiveness of designated old growth habitat areas further west. This road crosses an important travel corridor. Restricting access to walk-in use would benefit wildlife conservation values.
Cost of maintenance	Cost of maintenance of this road after closure is \$190/year (compared to \$1,345/year to keep it open).

#### Upper King George Road (Segments 6 and 7)

*Major drainage structures would be removed if these segments are constructed.*

These segments access units 19-21 in upper King George Creek under **Alternatives 2, 3 and 5**. Alternative 3 would keep the first 1 mile of road open while Alternatives 2 and 5 would remove all drainage structures from Segment 7 and eliminate vehicle access (except for administrative maintenance) on Segment 6 by a gate on Segment 4. **Alternatives 1, 4, and 6** would not construct these segments.

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**Table 3-15: Effects of Road Development and Maintenance, Segments 6 and 7**

Issue	Effects of Road Segments 6 & 7
Scenic and Recreation	Portions of this road would be seen by hikers at Bessie Peak. The road would provide limited additional access for hiking biking or motorized travel.
Economics	By closing the road at the south end of segment 6 and removing the drainage structures beyond, access could still be provided for outyear planting and thinning needs while substantially reducing the risks of road washout. Harvest of the units on Segment 7 would remove the majority of manageable timber that could be accessed so there is no reason to keep it open.
Freshwater System	Crosses extreme upper limit of Class II habitat at three sites. All drainage structures in Segment 7 will be removed to mitigate effects on freshwater system over the long term..
Habitat Conservation	Improved access may increase harvest of some large game animals. Restricting access to walk-in would benefit wildlife using the travel corridor between Kunk Lake and the King George drainage.
Cost of Maintenance	Once structures are removed, the cost of maintenance under Alternative 3 is \$2,690/year to keep the first mile of road open to motorized use compared to \$250/year under other alternatives.

#### Lower King George Road (Segment 8)

This segment accesses the lower King George land unit. **Alternatives 2 and 5** would build the entire 2.4 miles of this road. The road would be closed to motorized travel (gate on segment 4) to reduce impacts on the wildlife habitat corridor and the designated old growth area. Major drainage structures near the end of the road would be removed since further road extension is not anticipated at this time. Occasional access by vehicle for maintenance of minor culverts would be maintained. **Alternatives 1, 3, 4 and 6** would not build this segment.

*If constructed, restricting motorized access would retain the high habitat values in the lower King George area.*

**Table 3-16: Effects of Road Development and Maintenance, Segment 8**

Issue	Effects of Road Segment 8
Scenic and Recreation	This road is not visible from Stikine Strait. The road would provide improved access for hikers, bikers and motorized use in the King George valley. The road ends about 1/3 mile from the King George estuary but does not cross the ridge used by hikers accessing Bessie Peak.
Economics	Keeping this road open for a period of time after harvest would help reduce the cost of any anticipated planting activity as well as provide access to potential small sales.

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<b>Freshwater System</b>	Crosses one Class II stream. Use of temporary log stringer bridges will mitigate short and long term effects on freshwater system.
<b>Habitat Conservation</b>	Improved access to the lower King George valley and stream system will reduce the effectiveness of the designated old growth in this area and may lead to increased hunting and trapping of furbearers.
<b>Cost of Maintenance</b>	After closure to motorized use and removal of some structures, the cost of maintenance would be \$900/year (compared to \$6,456/year if it were maintained for motorized traffic).

#### Honeymoon South Road (Segments 1 and 9, Alternative 2 only)

*Alternative 2 proposes constructing the road on the south side of Honeymoon Creek.*

Alternative 2 investigates the possibility of road development on the south side of Honeymoon Creek. This road crosses Honeymoon Creek twice, once about 1 mile upstream, and again near the pass. Under Alternative 2, the road would remain open to motorized use and possible future extension.

**Table 3-17: Effects of Road Development and Maintenance, Segments 1 and 9**

<b>Issue</b>	<b>Effects of Road Segments 1 &amp; 9</b>
<b>Scenic and Recreation</b>	Parts of this road would be visible from Zimovia Strait as it crosses the larger muskegs. The road would provide improved access and an attraction for hikers, bikers and motorized use in the interior of the study area.
<b>Economics</b>	This road is located away from the bulk of the commercial forest in the Honeymoon watershed. Helicopter yarding or the development of temporary roads on the north side would be needed to access this forest land in the future. This would increase logging costs substantially over development of the road and harvest on the north side. Building this road on predominantly muskegs will also increase construction costs due to the increased rock base needed.
<b>Freshwater System</b>	This segment crosses Honeymoon Creek in two locations and also crosses several Class II and Class III streams that feed into Honeymoon Creek..

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<b>Habitat Conservation</b>	Location of this road away from major old growth blocks on the north side of Honeymoon Creek will reduce the potential for increased harvest and maintain the effectiveness of old growth blocks. The road also crosses the pass at the head of Honeymoon Creek which is a travel corridor for big game in the study area. Keeping this road open will limit the effectiveness of the corridor for wildlife and would enhance hunting opportunities for people with means to transport motorized vehicles. Restricting access to walk-in travel would benefit habitat conservation values.
<b>Cost of maintenance</b>	The cost of maintaining this road for motorized access is \$5,800 per year (compared to \$550/year if it were closed).

#### Temporary Roads (Segments 13, 14, 17, 22 and 50)

Units 13, 14, 15, and 5 have temporary roads within the units which will be closed after harvest by blocking access, removing all culverts and bridges and restoring the natural drainage patterns. The standard closure technique is to block access, remove all drainage structures, and restore natural drainage according to BMP 14.24. The total miles of temporary road included in these units is 1.3 miles.

*Temporary roads, by definition, are closed after harvest.*

#### Summary of Road Maintenance Costs by Alternative

- Alternative 1= No road
- Alternative 2= \$11,500/year
- Alternative 3= \$15,000/year
- Alternative 4= \$8,500/year
- Alternative 5= \$13,404/year
- Alternative 6= No road or harvest

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#### Issue Three - Freshwater Systems and Estuaries

*"Any decline in natural stocks impacted by roads, logging, public access, etc. will be off set by the 'fish farmers' [hatcheries]."*

*"The analysis should discuss whether projects could cause reductions in habitat capability or impair designated uses."*

*"The material along Honeymoon Creek should be left for at least 200 feet as salmon and trout are in this stream, even though I have heard officials say there are none in Honeymoon Creek so I guess I must not have eaten them..."*

*"Maintain a 300 foot buffer on all Class I streams in King George drainage. This will compensate for marginal soils to support roads and the fact that some Class I streams were probably not identified."*

*"I suggest staying at least 500 feet from any stream feeding King George or Honeymoon. When developing the LTF do not create a large rock pit on the water. Move the sort yard up from the beach to minimize the conflict between logs and fishermen."*

*"If you do harvest in King George, keep roads and clearcuts away from all streams. Narrow buffers on side channels will most likely blow down due to high winds that blow down the valley, perpendicular to the side channels."*

*"Do not place an LTF on the King George side."*

*"Dungeness crab are abundant year round at the mouths of King George and Honeymoon Creeks. The crab population at Pats Creek was very good until log waste was introduced to the water, then the population dropped off. Crab gear has been hung up in cables and straps with bark in the pots."*

*"Nonpoint source water quality impacts should be minimized through project design and mitigation measures consistent with the state's nonpoint source program. The NEPA document should discuss the effectiveness of current BMPs based on what has been implemented at the project site and/or monitoring results."*

*"The soils in the project area should be described and related to landform stability and watershed sensitivity."*

*"Discuss the cumulative effects of any proposed future entries with respect to water quality and quantity and fish habitat."*

#### Introduction

This issue reflects concern for the effects of timber harvest and road construction on the fish habitat of north Etolin Island. The state has designated the beneficial use of waters in the King George study area for the growth and propagation of fish, shellfish, other aquatic life, and wildlife (18 AAC 70). By law, we must maintain that use, protect riparian habitat, and prevent detrimental changes in water temperature, water chemistry, streamcourse blockages, and sediment deposits that adversely affect water conditions or fish habitat.

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The freshwater system includes fish streams and their tributaries, floodplains and riparian areas, wetlands (including estuaries) and sediment sources with potential influence on fish habitat. This issue also addresses wildlife habitat associated with the freshwater system.

*The freshwater system issue addresses potential effects on fish habitat.*

Most of the freshwater system is within the King George and Honeymoon land units. Almost none of Zimovia, Red Mountain, and Porcupine land units and none of Chichagof Face land unit drain to fish streams. The unit and road cards (Appendix B) address slope stability and water quality concerns throughout the study area. This section will present the freshwater system components, describe their distribution, and compare alternatives by measuring potential impacts on aquatic habitat.

## Freshwater System Components

### Fish Habitat, Floodplains, and Riparian Areas

**Fish Habitat:** Streams containing fish populations comprise the core of the freshwater system. ADFG inventoried most of the study area streams in 1980. Except for streams located in the Chichagof Face land unit, we sampled all study area streams by electrofishing in 1993-94 using coho salmon fry or juveniles as the indicator for anadromous fish presence. Electrofishing also determined the extent of resident fish populations in streams inaccessible to anadromous fish. We did not sample the steep bedrock streams flowing directly into salt water from the Chichagof Face land unit because these streams do not contain habitat suitable for fish.

*Most of the freshwater system lies within the King George and Honeymoon land units.*

Table 3-18 displays the distribution of anadromous (Class I) and resident (Class II) stream length among land units. King George Creek and Honeymoon Creek are the most productive fish streams in the study area. We did not find Class I streams in the Red Mountain, Chichagof Face, or Porcupine land units.

**Table 3-18: Stream Length by Class (feet)**

Land Unit	Class I	Class II	Class III
Chichagof	0	0	64,620
Zimovia	< 100	< 300	15,710
Red Mountain	0	300	48,770
Porcupine	0	600	6,230
Honeymoon	1,610	19,390	80,730
King George	41,880	12,820	128,870
<b>Total</b>	<b>43,490</b>	<b>33,150</b>	<b>344,970</b>

**Floodplains and Riparian Areas:** Floodplains moderate floodflow, recharge low flows, and provide deposition areas for sediment. The decay of salmon carcasses deposited on floodplains during fall peak flows is an important part of the nutrient cycling process. Riparian areas, including floodplains, contain vegetation that provides temperature-moderating shade, large wood for fish habitat and channel stability, and litter fall as a nutrient and food source for fish. Intact riparian areas also intercept sediment and provide critical habitat for wildlife species dependent on aquatic organisms. The lower King George land unit contains about 80 acres of floodplain soils; we did not map narrower floodplains separately but included them in the riparian model (below).

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We used a riparian model to display streamside forest processes important to fish and wildlife habitat for all streams currently included in the GIS database (Figure 3-14). Tongass National Forest stream classification by channel types reflects physical differences in stream channels and stream processes (USDA Forest service, 1992). The model assigns a consistent streamside width to each stream segment according to channel type characteristics. The width is based on streamside vegetation data for streams dependent on large woody debris for stability or habitat quality. Total riparian widths (channel plus two sides) vary from 140 feet to 400 feet. The smaller widths reflect well-contained bedrock channels where riparian influences are most critical immediately adjacent to the stream. The larger widths characterize alluvial stream channels dependent on large wood for stability and habitat quality. These larger widths encompass floodplains and some important wildlife habitat. The study area contains about 480 acres of riparian area represented by this model. After we ran the model, we compared road and unit locations to see where potential overlaps occurred. The overlaps were given high priority for field verification to evaluate the effects on the riparian area. Generally, the riparian area was found to be adequately protected by the standard 100-foot TTRA buffer and the width of the riparian area in the field was narrower than that predicted by the model.

#### Class III Tributaries

The freshwater system includes over 40 miles of streams that do not contain fish but have potential influence on downstream fish habitat (Class III streams). Although some of these streams do not flow year-round, when they do flow, they transfer water, sediment, nutrients, and coarse wood to fish streams. Class III streams also provide habitat for micro-organisms, aquatic invertebrates, and amphibians that may be important food sources for fish and some wildlife species. Class III stream riparian areas are often very narrow or indiscernible.

An additional 20 miles of streams flow directly to saltwater with no influence on the fish habitat in the freshwater system. These streams are also Class III streams.

#### Wetlands (Including Estuaries)

*The project area is about 20% wetland.*

We used The National Wetlands Inventory (Cowardin et al., 1992) and Stikine Area soil inventory to map and classify wetlands. A total of 4,700 acres of wetlands were mapped, including high mountain lake and estuarine areas. Wetlands make up about 20 percent of the King George project area. Wetlands are displayed in Figure 3-14, and include lakes, estuaries, floodplains, and non-estuarine wetlands.

Wetlands are valued for physical functions such as flood conveyance, surface and groundwater regulation, sediment collection and temperature moderation; chemical functions such as nutrient storage, pH moderation, carbon storage; and biological functions such as habitat for terrestrial, aquatic and marine plants and animals, and wood fiber production.

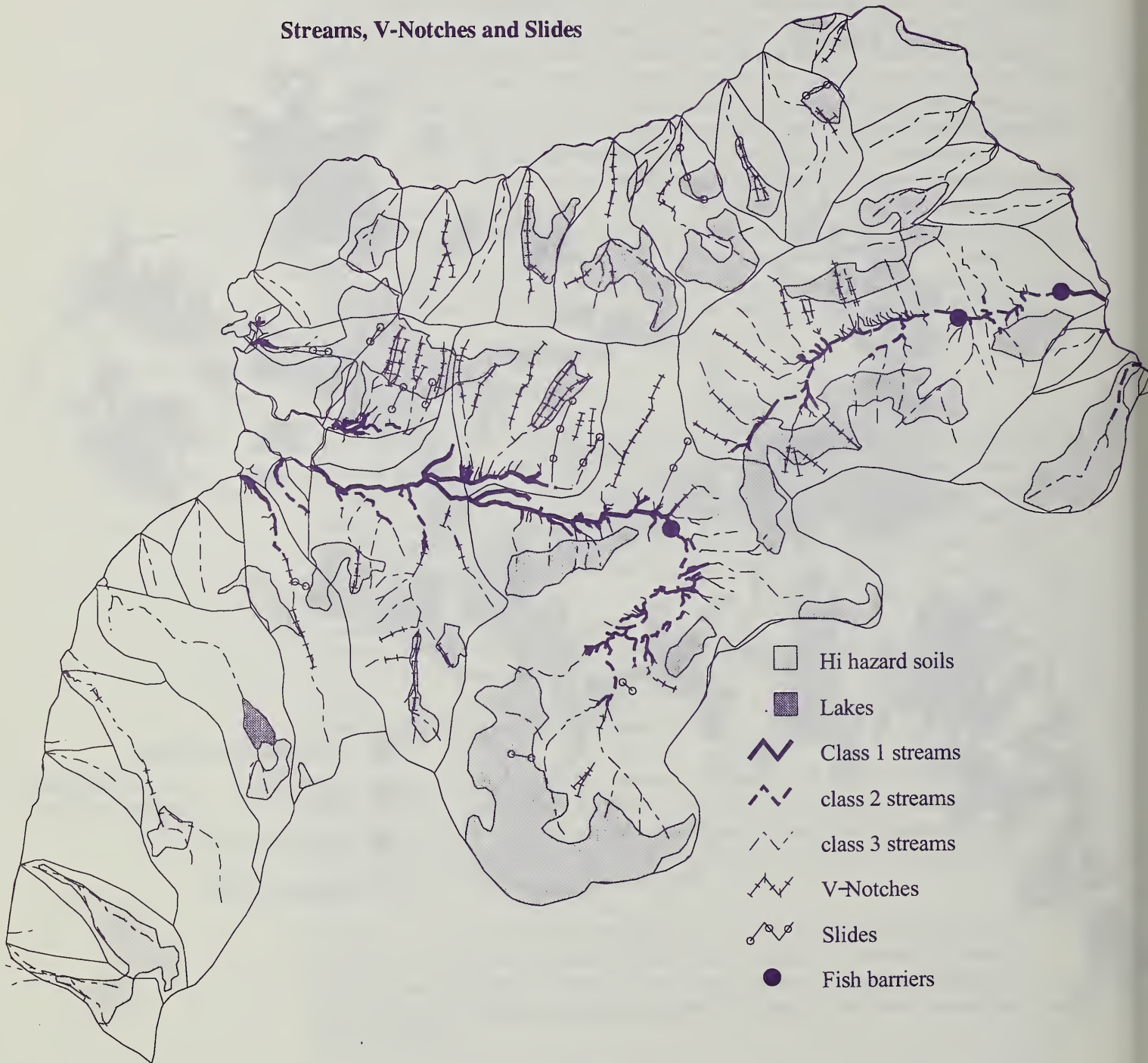
Numerous wetland types make up the non-estuarine wetlands. The colloquial term "muskeg" is used to refer to the mosaic of fens, bogs and scrubby forests. High precipitation and low evaporation rates contribute to the high amount of ground water resulting in the formation of wetlands. The type of vegetation growing on the wetland is primarily controlled by ground water chemistry, the amount of water and to an extent elevation. The wetlands present in the study area are described as follows.

### 3 - Affected Environment and Environmental Effects

Figure 3-14, Freshwater System Maps



#### Streams, V-Notches and Slides



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**Alpine Shrubland/ Muskeg** (220 acres): Vegetation is a combination of sedge meadows on deep peat deposits in depressions, with low growing blueberry and heath on higher rises. Stunted lodgepole pine and mountain hemlock are common. These wetlands function mainly as areas of snow storage and meltwater discharge and summer habitat for terrestrial wildlife species. These wetlands are located at an elevation of 1500-2,500 feet in the project area.

**Short Sedge Muskeg**. (220 acres): These wetlands function as areas for recharge of groundwater and streams; deposition and storage of sediment, nutrients and other chemicals; waterfowl habitat, particularly Vancouver Canada geese and sandhill cranes; terrestrial wildlife habitat, including black bear, mink, river otter, and beaver foraging. They support fen communities dominated by short sedges.

**Forested Wetland/Sedge Complex**. (1,700 acres): This is the most extensive wetland type in the study area. Vegetation is a mosaic of forested community types and sedge meadow fens on poorly drained peat soils. The forested areas are often linear features along streams dissecting a muskeg; and are generally productive forest sites. The mosaic pattern increases the diversity of this wetland type. Waterfowl habitat, particularly Vancouver Canada geese and sandhill cranes; terrestrial wildlife habitat, including black bear, river otter, mink, marten, and beaver foraging are provided by this wetland type.

**Scrub-Shrub/Muskeg** (610 acres): This wetland supports a mosaic of forested and bog vegetation. When conifers are present they are less than 25 feet high. Forested areas are found on gently sloping hills; marginally productive sites. These wetlands function as areas for recharge of groundwater and streams; deposition and storage of sediment, nutrients and other chemicals.

**Forested Wetland** (1240 acres): Forested wetland plant associations, including those with skunk cabbage and deer cabbage as a major ground cover component. These wetlands function as areas for recharge of groundwater and streams; deposition and storage of sediment, nutrients and other chemicals. This includes areas which support a mixture of wetlands and non-wetlands in a complex mosaic of microtopography that controls drainage and water regimes. The lower King George floodplain supports Sitka spruce plant community types, including Sitka spruce/devil's club and Sitka spruce/blueberry/skunk cabbage plant associations. The soils are mainly the Tonowek soil series, with lesser amounts of the Tuxekan series. Within the floodplain, there are significant areas of gravely alluvium overflow channels and non-wetland soil types. Forested wetlands also occur on upland sites not associated with riverine habitat; soils are mainly the Maybeso soil series.

**Sphagnum Peat Muskeg** (830 acres): Bogs characterized by deep, very-poorly drained accumulation of sphagnum moss; the soil series is Kogish. These wetlands function as areas for recharge of groundwater and streams; deposition and storage of sediment, nutrients and other chemicals. They are a valuable source of biological diversity, supporting a number of unique and some locally rare plant species. It is found in the King George and Honeymoon valley bottoms.

**Riverine:** Aquatic habitats within the wetted perimeter of a stream are termed "Riverine" wetlands in the National Wetland Classification System. These wetlands are not included as mapped acres in the wetland analysis because we decided they were more accurately portrayed by our riparian model.

**Lakes and Ponds:** There is a 21 acre lake and numerous small muskeg and beaver ponds within the study area. Although many do not contain fish habitat, as part of the freshwater

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system they play an important role in sediment deposition, nutrient cycling, and amphibian habitat.

*Estuaries contain the most valuable fish and wildlife habitat in the study area.*

**Estuarine (160 acres):** Estuaries are areas where fresh water mixes with salt water; unique brackish environments supporting complex and productive ecosystems. They are the most valuable wetlands in the project area, in terms of providing fish and wildlife habitat. Although salt water heavily influences estuaries, we included them in the freshwater system because streams provide the major link between forest management and estuarine ecosystems. Any analysis of fish habitat productivity would be incomplete without addressing estuarine use at various life stages. Estuaries are found in or adjacent to the King George, Honeymoon, and Zimovia Face land units. Grasses and sedge, especially tufted hairgrass, Lyngby's sedge and dune wildrye are the dominant species in the upper-intertidal zone. Common plants on upper beaches include beach-carrot, beach pea, large headed sedge, paintbrushes, and lupine. Shingle beaches, composed of large gravels or cobbles are located north of Honeymoon Creek.

#### Upland Sediment Sources

There are two main kinds of soil erosion that take place in Southeast Alaska: surface erosion and mass wasting. Surface erosion is caused by wind or water. This type of erosion takes place over a long period of time and produces a relatively small amount of sediment at a constant rate. Surface erosion is practically nonexistent under the forest canopy except in areas of mass wasting, because the mineral soil is covered with a thick organic surface layer. Mass wasting occurs in major pulsating events, such as landslides.

*Four classes rank areas for landslide potential:*

- **MMI 4 - Very High**
- **MMI 3 - High**
- **MMI 2 - Moderate**
- **MMI 1 - Low**

Mass movement index (MMI) classes are used to group soil/landtype units that have similar properties relative to the stability of natural slopes. Four classes, very high, high, moderate, and low, (MMI 4, 3, 2, and 1) are used to rank soil/landtype units according to their relative potential for mass wasting, i.e. debris avalanches. While slope gradient is the primary site factor determining the stability of natural slopes, other soil and geologic properties, such as cohesion, moisture regime and the presence of a prominent slip plane are also used to determine relative stability of soil/landtype units. Mass-wasting classes as used here are restricted to relatively shallow transitional failure off the soil mass, and specifically excludes deep rotational failures and debris failures within stream channels. The classes are as follows.

Soil map units with **MMI 4** are the least stable and have the greatest probability of slope failure. Slope gradients exceed the natural angle of stability. Included are well-drained soils on slopes greater than 75 percent and soils with restricted drainage (somewhat poorly and poorly drained soils) on slopes greater than 60 percent. Nearly all natural occurring landslides initiate in units of this class. These areas, often, but not always, have visible indications of instability or past failures, such as slide scarps, tension cracks, jack-strawed trees, and/or mixed pedogenic horizons. The risk of management induced slope failure is so high on these areas that they are generally precluded from normal forest harvest and roading activities and are removed from the commercial forest land base.

Soil map units in the **MMI 3** class include the somewhat poorly and poorly drained soils on slopes ranging from 35 to 60 percent. Soils are generally stable in an undisturbed condition, however, any natural disturbance or management practice that adversely changes the complex soil shear strength-shear stress relationship can result in slope failures. Management practices should avoid interrupting the natural surface and subsurface drainage patterns and minimize disturbance to the soil surface. Excessive slope loading by sidecasting spoil material should also be avoided.

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Soils in the **MMI 2** class include the well drained soils on slopes ranging from 35 to 75 percent. Soil/landtypes in this class can be managed without a high risk of landslides if management practices are designed to maintain the soil shear strength, rooting strength, and by avoiding increasing the effective weight of the soil mass.

Soil map units with a **MMI 1** mass movement index have a low risk of slope failure. These areas are normally not subject to debris avalanching, however management practices designed to protect streambanks and v-notches, and prevent surface erosion may be applicable.

In addition to the **MMI 4** areas, **v-notches and landslide tracts** have a very high risk of slope failure. V-notches serve as direct sediment routing sources delivering sediment to streams. Landslides generally have a deposition zone above the stream. However, small streams usually drain the slide tracts, increasing the sediment delivery to streams.

Rooting strength is a major factor contributing to soil stability on oversteepened slopes. With the harvest of timber, roots deteriorate and are no longer effective at providing stability.

#### The Freshwater System in King George Land Unit

##### Fish Habitat, Floodplains, and Riparian Areas

**Fish Habitat:** Relative to other study area streams, King George Creek is by far the largest (in terms of stream length and drainage area) and most productive (in terms of species richness and escapements) fish stream. Pink, chum, coho, and sockeye salmon, cutthroat trout, and Dolly Varden char inhabit King George Creek and its tributaries. State escapement surveys conducted between 1965 and 1994 indicate peak escapement of about 3,250 pink salmon (1977). A small steelhead population is likely, but has not been verified. Because of its existing "undisturbed" condition, relative productivity, floodplains, and enhancement opportunity we performed a detailed fish habitat survey of Class I and II tributaries of King George Creek in 1993-94.

*King George Creek is the most productive stream in the study area.*

Survey results indicate that large woody debris, stream channel morphology (pools) and substrate (stream sediment) size provide excellent fish habitat conditions in much of the mainstem of King George Creek as well the lower reaches of many of its tributaries. Bears, eagles, wolves, beaver, land otters, mink, weasel, and marten use these streams and riparian areas for food and habitat.

Table 3-19 compares surveyed habitat parameters from King George Creek with the regional Riparian Habitat Management Objectives (RHMOs) obtained from the Anadromous Fish Habitat Assessment (AFHA) Report to Congress (USDA Forest Service 1995). The RHMOs are expressed as a range of values based on the 25th, 50th (median), and 75th percentiles stratified by channel types that have similar physical characteristics (USDA Forest Service 1992). The data was collected from pristine watersheds throughout the Tongass National Forest. The King George Creek data has not been adjusted for observer bias, but is still useful for comparison with other pristine watersheds.

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Table 3-19, Comparison of King George Creek Habitat Data with RHMOs

RHMO Parameter	Channel Type or Process Group	Regional Percentile			King George Values
		25%	50%	75%	
Pieces LWD/1000 m2	FP4	8	24	34	57a
	LC & MC	6	15	22	25a
	MM1	27	45	82	99a
	MM2	33	35	44	40
Percent Pool Area	FP4	35	47	59	57
	LC	8	20	27	7b
	MC	11	22	39	9b
	MM1	28	40	52	40
	MM2	2	22	39	22
Bankfull width-to-depth	FP4	16	25	35	15b
	MM1	9	12	18	8b
	MM2	17	24	33	17

a - Above RHMO

b - Below RHMO

Large Woody Debris (LWD) is defined as wood material greater than 10 centimeters in diameter and 1 meter in length, protruding into the active stream channel area. Large wood is critical in many streams for maintaining habitat cover and complexity for fish and aquatic invertebrates that provide an important food source for fish. LWD structure, recruitment, and depletion can be greatly influenced by management activities. King George Creek exceeds the regional objectives for LWD in floodplain (FP), Large Contained (LC), Moderate Gradient Contained (MC), and Narrow Moderate Gradient Mixed Control (MM1) streams.

Pools are very important stream features that provide habitat for rearing juveniles, cover for adults, and optimal spawning sites at pool tail-outs. Changes in the amount of pool units can indicate shifts in the balance between sediment and streamflow regimes, and can therefore be good indicators of cumulative watershed effects. Survey data indicate that King George Creek has slightly less pool area than the regional ranges for Large Contained and Moderate Gradient Contained channel types. Otherwise, pool area provided by King George Creek is quite similar to other pristine systems.

Width-to-Depth ratio is a general index of channel stability in alluvial channels, predominantly Floodplain and Moderate Gradient Mixed Control streams. Channel segments with consistently high width-to-depth ratios indicate sediment storage and channel aggradation which can lead to reduced flow depth, loss of pool area and volume, de-watering of aquatic habitat, and adverse changes in stream temperature ranges. King George Creek falls into the lower range of width-to-depth objectives.

Upper and lower King George Creek are separated by a partial migration barrier located 2.5 miles from salt water. Only Dolly Varden char are known to gain passage through the 300-foot series of bedrock falls. Upper King George Creek has over two miles of very low gradient stream with suitable substrate for coho and steelhead spawning. Deep pools and beaver dams in both upper and lower King George Creek also provide good coho rearing habitat. Passage for coho and steelhead (if present) to upper King George Creek appears feasible with minimal investment and maintenance by blasting jump pools. The mainstem of upper King George Creek and its low gradient tributaries are considered Class I stream since the barrier may be enhanced.

*There is an opportunity to provide anadromous fish access into Upper King George Creek.*

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**Floodplains and Riparian Areas:** Soil, vegetation, and stream channel characteristics along two reaches of King George Creek indicate that these are the most important floodplains in the study area. Riparian areas along the alluvial channels in this watershed are the most well-developed in the study area, reflecting the influence of overbank streamflows on the adjacent landform and vegetation. The floodplain channel and its tributaries provide the most productive fish habitat along the lower two-thirds of King George Creek. Well-used game trails along the mainstem and tributaries of King George Creek indicate its importance as a wildlife travel corridor. This area is heavily shaded by topography and riparian canopy. Aquatic productivity through this reach may be light- or temperature-limited.

All harvest units in the King George drainage are over 100 feet from the mainstem in order to protect this high value riparian area. The width of the buffer varies from unit to unit but in many cases is dictated by the presence of small Class I and II tributaries which were discovered during intensive field reconnaissance. The need to adequately buffer these streams in combination with the design of logical harvest settings resulted in some buffers that exceed 100 feet.

*All harvest units are at least 100 feet from fish streams.*

Windthrow plays a natural role in supplying large wood to streams, and has been identified as a concern for long term buffer stability. When an opening is created by clear-cut harvesting, it often leaves an abrupt face of standing timber which is susceptible to windthrow (Harris, 1989). A study is underway to determine both the extent of buffer windthrow and its consequences on stream channels across the Tongass National Forest (USDA Forest Service, unpublished) and monitoring sites were recently established in the Campbell Timber Sale in the Bradfield Canal. In general, existing windthrow in the study area appears to be concentrated on the King George side of the pass between Upper King George and Honeymoon land units, in the vicinity of unit 17. Harvest prescriptions leaving some standing timber may reduce the potential for accelerated blowdown. The Campbell Timber Sale buffers may provide more information on this theory since these units retained leave trees. Each unit card addresses windthrow risk.

Stand openings created by Units 23 and 24 along the south side of King George Creek may increase sunlight penetration to the riparian area and stream which could increase the primary productivity, but this is not expected to be a measurable impact.

The interdisciplinary team evaluated four possible King George Creek road crossing sites. The lower crossing was dropped from consideration. This site would have required a large and expensive bridge to adequately address channel stability and fish habitat concerns. We considered three crossing sites in Upper King George land unit, all of which cross a narrow floodplain. The road was carefully located and designed to account for flood processes. Stream crossing structure design considers spawning habitat, fish passage, flood design flows, channel stability, and transport of large debris. The road approach minimizes floodplain impacts such as constriction of overbank flows or multiple side channel and tributary crossings.

*The King George Creek bridge location and design accounts for flooding, spawning habitat, fish passage, channel stability, and large wood transport.*

#### **Class III Tributaries**

The King George land unit contains the greatest amount of Class III stream length in the study area. Steep, deeply-incised streams (V notches) located on the north side of King George Creek are especially efficient at rapidly transporting sediment from unstable sideslopes or during debris flows. One of these streams, located at the west boundary of Unit 18, is too deep to economically or safely cross with a road. Another Class III stream

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*Careful consideration was given to locating and designing Class III stream crossings.*

crossing to access Unit 22 was dropped between the Draft and Final EIS due to economic and downstream fisheries concerns. Some Class III stream crossings planned in this drainage required careful road alignment and design to maintain channel stability and withstand high bedload and debris transport. These structures will require routine inspection and periodic maintenance to minimize the potential for structure failure and downstream channel scour. Some structures were designed as temporary structures to minimize potential long term effects on downstream fisheries.

#### **Wetlands (Including Estuaries)**

**Estuarine:** Shelter provided by King George Bay combined with the relatively large drainage area of King George Creek provides the most well-developed and productive estuary in the study area. The substrate of the deeper (low tide) area provides good shellfish habitat and a moderate amount of intertidal salmon spawning habitat. The shallower intertidal area stores fine sediment supporting sedges and grasses which bears and ungulates feed on in the spring. This salt marsh also provides critical salmon rearing and smolt transition habitat, and shorebird and waterfowl habitat. Adult fish use this estuary as a staging area for migrating up King George Creek. Eagles, ospreys, bears, wolves, mink, land otters and other wildlife are drawn to these attractions.

*Units and roads are at least 1,600 feet away from the King George estuary.*

Units 26, 27, and 28 and the road south of King George Creek are nearest to the King George estuary. The units range from 1600 to 1800 feet away and the road ends about 1800 feet away.

Two small coves north of King George Bay also support small estuaries. We propose a patch cut with ten percent retention (Unit 1) about 1100 feet from these small estuaries.

The interdisciplinary team evaluated several possible Log Transfer Facility (LTF) locations on the west side of the study area, some near the King George estuary. These sites were dropped from further consideration due to potential impacts on marine and estuarine resources. The site selection criteria and effects on estuarine and marine resources is further discussed in Appendix D.

**Non-estuarine:** The most important non-estuarine wetlands in King George land unit are associated with the stream system: floodplains and beaver complexes with tall sedge fens. Road location avoided these areas as much as possible. Extensive forested and forested/sedge complex wetlands are located in the King George valley. This land unit contains the most harvested wetland acreage, primarily in Unit 15 and 19. Special road construction measures such as installation of culverts to allow for water movement during low flows as well high flows will mitigate the affect of road construction on the sedge and sphagnum muskeg wetlands.

#### **Upland Sediment Sources**

King George land unit contains the largest blocks of MMI-4 soils in the study area. We avoided locating roads or units on oversteepened slopes north of King George Creek and below Bessie Peak. The north side of King George Creek has steep, highly dissected mountain slopes with numerous old landslide scars. The largest landslide is visible from King George Bay. For the most part, the wide valley bottom provides an area for sediment deposition protecting the stream from massive sediment loading. The valley is relatively narrow between Unit 18 and Unit 23.

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Road construction in the King George land unit will be a sediment source. Prompt stabilization of bared soil and cut and fill slopes along the road will minimize effects on the freshwater system.

#### The Freshwater System in Honeymoon Land Unit

##### Fish Habitat, Floodplains, and Riparian Areas

**Fish Habitat:** The Class I reach of Honeymoon Creek was surveyed in 1994. Honeymoon Creek contains a total block to anadromous fish access about 1000 feet upstream from salt water. Coho salmon, cutthroat trout, and Dolly Varden char inhabit the floodplain stream below the barrier. Pink and chum salmon likely spawn in this lower reach, but the timing of the survey could not confirm their presence. Because of the limited anadromous fish habitat in this drainage, the State has not conducted escapement surveys. The size of aboriginal fish traps found at the mouth of Honeymoon Creek would seem to indicate that the anadromous fish access might have been greater or the stream was somehow more productive in prehistoric times. Recent observations of the Harding River (Bradfield Canal) indicate that anadromous fish access can dramatically change as a result of a single flood. Cutthroat trout and Dolly Varden char were found in stream reaches shown as Class II.

*Honeymoon Creek has a total block to salmon 1,000 feet from saltwater.*

**Floodplains and Riparian Areas:** The riparian area adjacent to much of Honeymoon Creek is narrower than that found in the King George drainage because the stream is contained within a bedrock channel and floods infrequently. Terrestrial wildlife species do not seem to use this riparian corridor as heavily as the King George riparian areas. Downstream of the barrier, a portion of the Honeymoon Creek floodplain was harvested in 1965. An undisturbed buffer was maintained along most of the stream channel and it does not appear to have been directly affected.

##### Class III Tributaries

Honeymoon land unit contains the highest density of Class III streams in the study area. This is reflected in the large proportion of stream crossings proposed in this land unit. These stream crossings are less risky from a road maintenance and water quality perspective than some of those in the King George drainage. The road alignment on the north side of Honeymoon Creek minimizes fish stream crossings while avoiding over-steepened slopes.

##### Wetlands (Including Estuaries)

**Estuarine:** The mouth of Honeymoon Creek is not sheltered and lacks the topography supportive of a well-developed estuary. Nevertheless, this area is known as productive shellfish habitat and provides limited intertidal salmon spawning habitat. Potential effects on this estuary and near-shore crab habitat was an important consideration in locating and designing the LTF, which will be about 2600 feet north of the creek mouth. Appendix D provides further detail about the LTF. Unit 8 and Road Segment 1 (including the sort yard) each lie about 2100 feet from this estuary and comprise the nearest proposed disturbance.

*The proposed LTF is about 2,600 feet from the mouth of Honeymoon Creek.*

**Non-estuarine:** Forested wetlands, sedge and sphagnum muskegs dominate the Honeymoon valley bottom. The proposed road will pass through wetland habitat near the pass and near Unit 6. The alternate road located south of Honeymoon Creek (Alternative 2 only) would affect more wetland than any other proposed road segment while avoiding

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a unique, possibly rare, large diameter Sitka spruce/Alaska yellow-cedar stand. The proposed sort yard will be about five acres in size and is located in a scrub-shrub/muskeg wetland.

#### Upland Sediment Sources

Over-steepened slopes are located on both sides of Honeymoon Creek. Roads and units are not located on these slopes. The upper portion of Unit 13 has steep slopes with MMI-3 soils. Selective harvest, retaining a high number of residual trees and minimal ground disturbance with helicopter yarding is expected to minimize mass wasting risk.

#### The Freshwater System in Other Land Units

##### Fish Habitat, Floodplains, and Riparian Areas

Less than 400 feet of anadromous and resident fish habitat at the mouth of a small stream on Zimovia face and less than 300 feet of resident fish habitat on an alluvial fan at the mouth of Porcupine Gulch land unit were harvested in 1965. The habitat in these small streams may have been directly affected by the harvest practices employed at that time. Alder trees dominate the riparian vegetation along these streams and habitat currently does not appear to be degraded in these short reaches.

##### Class III Tributaries

Only a few Class III tributaries feed the freshwater system outside of King George and Honeymoon land units. Unit and road cards show Class III stream protection for all Class III streams in the study area.

##### Wetlands (Including Estuaries)

**Estuarine:** Fresh water/salt water mixing zones at the mouths of small creeks along the study area shoreline may provide limited intertidal spawning and nutrients supporting shellfish and other marine life.

We considered two locations for an LTF on the east side of the study area. The northernmost site would have directly affected a small Class III stream. A final site about 2600 feet north of Honeymoon creek was chosen. The site overlaps with a thin estuarine area mapped along the shore. However, this site is a steep rock face with no estuary features such as intertidal flats or marshes. The transition from land to saltwater is abrupt, with no mappable streams in the vicinity.

*A sort yard will be constructed about 800 feet inland from the LTF.*

The interdisciplinary team modified the LTF and sort yard design to reduce scenic impacts and minimize the amount of bared ground in close proximity to marine waters. The sort yard will be located 800 feet away (inland) from the LTF. The LTF card (Appendix D) describe site specific design and erosion control measures intended to minimize impacts to estuarine and marine resources. Appendix D contains the LTF site selection criteria and discusses potential affects on marine resources.

**Non-estuarine:** There is a 21 acre lake in the Red Mountain land unit at 1,600 ft elevation. Sampling of the outlet stream upstream from salt water revealed no anadromous or resident fish species. Since no harvest units or roads are proposed nearby, the lake itself was not sampled. Scattered muskegs and forested wetlands are in all land units.

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#### Upland Sediment Sources

The oversteepened hillslopes draining to aquatic habitat outside of King George and Honeymoon land units are found in Porcupine Gulch land unit. Timber quality is poor in this area so timber harvest is not proposed.

#### Alternative Comparison

Timber harvest, road construction and road use have the potential to impact fish habitat by changing streamflow regimes, large wood supply and distribution, and sediment supply. The specific State water quality standards of most concern are criteria for sediment, turbidity, temperature, and petroleum hydrocarbons, oils and grease. The last criteria is related to the use of heavy equipment for road construction and timber harvest activities and is addressed through standard oilspill prevention and contingency plans (BMPs 12.8 and 12.9). Criteria for temperature, sediment, and turbidity are addressed through the application of BMPs. BMP implementation and monitoring in compliance with the Forest Service Memorandum of Agreement with the Alaska Department of Environmental Conservation is expected to meet the intent of the State water quality standards (which is to maintain fish habitat) in all alternatives.

Maintaining intact floodplains and riparian areas, limiting erosion risk by minimizing exposed soil and avoiding unstable soils, minimizing stream channel disturbance at road crossings, and limiting cumulative road length and harvested area in each watershed are all primary components of the fish habitat protection strategy in the King George study area. Most of these measures also protect fish species depending on the habitat, wildlife species depending on fish as food, and wildlife species depending on riparian areas for habitat and travel corridors.

The Report to Congress, Anadromous Fish Habitat Assessment (USDA Forest Service 1995), commonly referred to as the AFHA Report, was completed during the planning effort on King George. Some of the improvements in aquatic habitat protection recommended in the report have been incorporated into this project. Appendix E contains a comparison of this FEIS with the recommendations in the AFHA Report.

We evaluated each proposed unit and road segment with respect to its relative influence on the freshwater system. For example, a unit with MMI-3 soils (high sediment source risk) far away from streams (low sediment transport risk) does not pose as great a risk to fish habitat as a similar unit containing streams. A table at the end of Appendix B summarizes water quality and fish habitat concerns for all units and assigns a relative risk rating to units with moderate and high risk of sediment transport to fish habitat. Units 9, 10, 11, 12, 13, 14, 17, 18, 22, and 26 are most likely to affect fish habitat. A table at the end of Appendix B summarizes freshwater system concerns for each road segment. Road segments 2, 4, 7, 8, 9, and 13 are most likely to affect fish habitat. Site selection for monitoring BMP implementation will emphasize these units and roads.

Table 3-20 displays the affects of harvest and road construction by comparing freshwater system acres of harvest and miles of road construction across alternatives.

*All alternatives meet the goals of the Clean Water Act through BMP implementation and monitoring.*

*Alternatives 2 and 5 pose the highest risk relative to the other alternatives.*

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Table 3-20, Harvest Acres and Road Miles Within the Freshwater System by Alternative

	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6
Harvest Acres	260	560	480	350	790	0
Road Miles	0	9.8	6.7	3.3	9.7	0

Alternative 5 proposes the highest relative risk in this comparison, followed by Alternative 2. Alternative 4 poses the least risk of the roaded alternatives since it does not harvest units tributary to King George Creek. Alternative 1 poses the least risk of any action alternative since it disturbs the least acreage directly tributary to aquatic habitat. Alternative 6 does not pose increased risk of water quality or fish habitat degradation.

*Road Segments 4, 7, and 8 have the greatest potential to affect fish habitat relative to other road segments.*

Road miles are one of the best all-round indicators of freshwater system impacts. Alternatives 2 and 5 propose the greatest amount of road throughout the freshwater system. Alternative 3 proposes a road through Honeymoon but less road miles in King George. Alternative 4 does not propose any road in the King George drainage and Alternative 1 proposes no roads at all. Road segments 4, 7, and 8 received the highest risk ratings for potentially affecting fish habitat. These roads contain critical stream crossings and slope stability concerns as described in Appendix B. Critical stream crossings include streams with fish habitat as well as Class III streams with evidence of high debris and bedloads. Table 3-21 compares critical stream crossings across alternatives.

Table 3-21, Critical Stream Crossings by Alternative

	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6
Critical Stream Crossings	0	10	5	1	7	0

#### Effects on Fish Habitat, Floodplains, and Riparian Areas

The King George Creek crossing site proposed in Alternatives 2, 3, and 5 minimizes concerns for channel stability while maintaining an approach that minimizes other stream crossings. Alternatives 1 and 4 have the least impact on floodplains since they do not propose any floodplain crossings. Bridges and culverts do present a risk of blockage and potential failure at high stream flows which can result in downstream scouring. Road construction, particularly drainage structure installation, has the greatest potential of any activity for temporarily exceeding water quality criteria for turbidity. BMPs restricting timing and stream channel disturbance minimize this potential. We do not expect turbidity increases beyond what naturally occurs during routine high flows.

By law, all Class I stream and Class II streams tributary to Class I streams receive a minimum 100-foot no-harvest buffer. The objective of this buffer is to maintain an intact streamside area providing shade, large wood, and minimal stream or riparian area disturbance. The buffers minimize the potential for adverse changes in stream temperature, thereby addressing State water quality standards for temperature. The benefits of buffers in contrast to streamside harvest of alluvial stream channels are fairly intuitive and well documented (Murphy et al, 1986; Murphy and Koski, 1989; FEMAT, 1993; Ralph et al, 1994). The electrofishing survey resulted in modification of many of the units to account for buffers along previously unmapped streams. A long term buffer

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effectiveness monitoring project is underway with baseline data collected in TTRA buffered streams throughout the Tongass National Forest.

The mandatory 100-foot no harvest buffer excludes harvest from most riparian areas. Minor overlaps between unit boundaries and modeled riparian areas occur in all action alternatives. Alternative 5 has the greatest overlap, followed by Alternatives 3, 4, 2 and 1, in that order. These overlaps have been field reviewed and, except for some buffer windthrow risk, no direct impacts to riparian areas or stream channels are expected.

No floodplain harvest is proposed under any alternative. Alternatives 2 and 5 propose units approaching the King George floodplain, but buffered sidechannels and fish stream tributaries in this area resulted in unit modification away from the mapped floodplain.

*No floodplain harvest is proposed under any alternative.*

#### Effects on Class III Tributaries

Roads and harvest units involving Class III streams sometimes present greater risk to downstream fisheries than direct impacts to fish streams because of their efficient sediment transport regimes. Alternatives 5 and 2 present the highest risk for Class III stream crossings followed by Alternatives 3 and 4. Alternative 1 does not propose stream crossings.

Most of the proposed harvest units contain Class III streams which are typically protected through a combination of unit boundary design, partial harvest buffers, or yarding operations designed to minimize sideslope and channel disturbance by felling trees away from stream channels, providing log suspension during yarding, and removing debris inadvertently entering the streams during harvest. Appendix B describes and displays Class III stream protection in units.

Observation of timber harvest by helicopter, such as the recent Campbell Timber Sale in the Bradfield Canal, indicates that helicopter yarding minimizes Class III stream disturbance.

#### Effects on Wetlands (Including Estuaries)

**Estuarine:** All alternatives avoid impacts to the King George estuary. Alternative 5 proposes the greatest amount of disturbance near the estuary (four units, two road segments, and the LTF). None of the alternatives propose any disturbance within 1100 feet of estuaries. The nearest road is 2100 feet away. Although Alternative 1 proposes no LTF, it proposes three units within 2000 feet of the King George estuary.

*All alternatives avoid impacts to estuaries.*

Construction of the LTF will impact the estuarine shingle beach north of Honeymoon Creek. A shot-rock ramp and turn around pad will occupy 0.2 acres of intertidal and subtidal area.

**Non-estuarine:** The acres of wetlands affected by the proposed timber harvest and road construction varies with alternative. Road construction across wetlands is expected to be the primary factor affecting the wetlands, resulting in permanent reduction in wetland acreage. Roads will be constructed using overlay construction methods in accordance with best management practices described in FSH 2509.22, the Soil and Water Conservation Handbook to protect water quality and associated wetland functions.

*Roads and units avoid the highest value wetlands.*

The effects of harvesting timber on forested wetlands is expected to be temporary. Under cable and helicopter yarding the primary effect is the removal of overstory trees. When

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regrowth occurs wetland function should be similar to preharvest conditions. Roads and units were located to avoid the highest value wetlands, such as beaver ponds and estuaries. Roads are often located away from wetlands due to the higher construction costs of additional shot rock and cross drains. A study is underway on Wrangell Island to evaluate the effects of road construction across a wetland.

Table 3-22 displays the miles of road to be constructed on wetlands and the acres harvested by alternative across the entire study area. An approximate road footprint is estimated by assuming that overlay road construction will have an average total road prism width of 25 feet.

**Table 3-22, Wetland Acres Affected**

	Harvest Area (acres)	Road Distance (feet)	Total Acres
Alt 1	116	0	116
Alt 2	138	37,750	160
Alt 3	157	19,900	168
Alt 4	146	10,460	150
Alt 5	202	30,365	219
Alt 6	0	0	0

#### Effects on Upland Sediment Sources

*Alternative 5 poses the greatest risk of increasing upland sediment sources relative to the other alternatives.*

Alternative 5 poses the greatest risk for increasing upland sediment sources, followed closely by Alternative 2. Alternative 1 poses the least risk since it constructs no roads and all units are logged with a helicopter.

Timber harvest and road construction create soil disturbances that add to the natural rate of soil erosion. Yarding practices that protect the surface organic layer will reduce soil erosion. Full suspension of the logs will be achieved with helicopter logging, greatly reducing the amount of soil disturbance. Rooting strength is a major factor contributing to hillslope stability on over-steepened slopes. After harvest, tree roots decompose resulting in a loss of slope stability. Partial harvest may lessen the risk of failure related to loss of rooting strength, although it is not known how much retention is needed to be effective.

Increased windthrow resulting from timber harvest can increase soil erosion risk. Small landslides are often associated with windthrow on steep slopes. Swanston (1974) found that the number of slide associated with roads and harvest units was three times greater than in undisturbed areas.

An erosion control plan will be developed for logging and road construction. Surface erosion associated with road construction will be mitigated by prompt stabilization of cut and fill slopes. Site specific erosion control plans will be developed for all rock quarries to minimize soil erosion and sedimentation during and after construction.

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**Table 3-23: Harvest Acres by Alternative by Hazard Class**  
(includes unmanaged area within harvest units)

MMI	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6
1	200	186	198	252	344	0
2	455	433	414	437	632	0
3	155	267	205	179	297	0
4	78	81	75	76	82	0

**Table 3-24, Road Length (in feet) by Hazard Class.**

MMI	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6
1	0	46,393	34,393	25,521	50,237	0
2	0	9,066	8,420	1,434	10,309	0
3	0	2,812	0	0	5,679	0
4	0	0	0	0	0	0

### Watershed Sensitivity

A watershed sensitivity model (McCorison et al, 1989) rates about 4270 acres of watershed tributary to the freshwater system as very sensitive due to a relatively high proportion of steep, unstable soils, alluvial stream channels, and dense stream network. This is a simple empirical model using GIS soils and stream data to assign relative sensitivity ratings to watersheds which then suggest a subjective limit to harvest. The Honeymoon Creek and several small subwatersheds within Upper and Lower King George land units contain an inherently greater risk of erosion and sediment transport.

As shown in Table 3-25, the watershed sensitivity model suggests a low harvest threshold for several watersheds. This table shows the maximum level of harvest proposed for any alternative, in this case, Alternative 5. No alternative proposes harvest levels exceeding the suggested threshold. All alternatives exclude harvest from the watersheds with the lowest thresholds.

**Table 3-25, Watershed Thresholds**

Land Unit	Watershed ID	Area (acres)	Suggested Harvest Threshold (acres)	Maximum Proposed Harvest (acres)
Lower King George	Q52B	660	130	0
Upper and Lower King George	Q52C	3,470	1,400	390
Lower King George	Q52D	1,100	220	60
Lower King George	Q53A	290	120	0
Honeymoon	Q59A	2,220	890	290

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The dispersal of timber harvest across watersheds in combination with partial and selective harvest methods does not pose a risk in any alternative for measurably changing streamflow regimes in any watershed of the study area.

In summary, the action alternatives may be ranked for potential risk to aquatic habitat from highest to lowest as follows: 5, 2, 3, 4, 1. All alternatives employ Best Management Practices to minimize impacts on the freshwater system. All alternatives are expected to meet the goals of maintaining water quality and aquatic habitat.

## Issue Four: Habitat Conservation

*"Cumulative impacts must be considered in the EIS. This includes the old clearcut in Honeymoon, the slide area in King George, the Granite, Starfish, Olive cove sales and any other old clearcuts on Etolin as well as any future sales planned in the area."*

*"We are concerned that a sale of this size in two small watersheds will have serious impacts on fish and wildlife populations. This is the last large unfragmented area on N.Etolin and wildlife populations are effectively isolated from habitat on S. Etolin."*

*"The Forest Service has identified a volume class 7 stand which may be the only one of its kind on northern Etolin. The rarity of these stands requires that they be managed conservatively."*

*"It is encouraging to see a majority of units in some alternatives with silvicultural treatments other than clearcuts. Part of the reason for using other cutting methods is to maintain stand structure to provide better wildlife habitat after harvest."*

*"The effects of roading on marten, black and brown bears and wolves needs to be displayed and discussed in the EIS."*

*"What will be the effects on Goshawks, murrelets and other sensitive species?"*

*"Use of habitat capability models is presently the accepted way to analyze effects on wildlife."*

This issue encompasses public and other agency concerns about impacts to the natural plant and animal habitat diversity occurring at various scales. Measures used to address the habitat conservation issue include: fragmentation; old-growth habitat retention; travel corridors; vertical forest structure and diversity; threatened, endangered, sensitive species, special interest species, indicator species and special or unique habitats.

## Fragmentation

Habitat fragmentation is a process by which habitats are increasingly subdivided into smaller units, resulting in increased isolation of habitat blocks and loss of total habitat (Noss & Cooperider 1994). In Southeast Alaska this problem is magnified on islands. The formation of endemic species (species unique to an area) or subspecies is common in island systems, such as southeast Alaska (Suring et al 1993). Harris (1984) states that according to island biogeography, presence and persistence of wildlife species on true oceanic islands is governed by the size of the island, distance from mainland, and diversity of habitats on the island. Fragmentation on Etolin Island is caused by windthrow, landslides, natural topography and management actions.

*It is possible to fragment an area twice the size of actual harvest.*

For many years, forest managers have designed harvest units in staggered settings that result in a regular pattern of similar sized clearcuts with leave strips between the units. When viewed from the traditionally taught ideas of wildlife habitat management this pattern maximized edge habitats to the benefit of many wildlife species. Creation of an edge habitat was, and remains, a desirable habitat objective for many species. Recently, a broader perspective of wildlife ecology has recognized that certain groups of wildlife prefer forest interior habitats not affected by openings or abrupt edges created by timber harvesting. Research has shown that edge effects may extend up to two to three tree heights into the forest stand (Harris, 1984).

### 3 - Affected Environment and Environmental Effects

When viewed at a larger landscape scale this staggered setting harvest technique has fragmented many areas thus reducing the availability of interior forest habitats. Simulation studies have displayed that when as little as 50% of the forest in a watershed has been harvested in this manner, little if any forest interior habitat conditions remain. This could have long term negative impacts on old growth ecosystems and maintenance of plant and animal diversity.

*Appendix A summarizes the results of an island-wide analysis on the possible fragmentation of large blocks.*

To assess the current availability of old growth forest habitat necessary to provide for biodiversity and insure viable well-distributed populations of old growth associated species, large blocks of mature forest were mapped on Etolin Island. Appendix A displays the results of the Etolin Island analysis and displays the possible cumulative effects of this action along with past and foreseeable future harvest.

The study area contains one of nine large blocks of old growth on Etolin Island. Most of the study area is in its naturally occurring condition. Two harvest units are located in the beach fringe (old "A-frame" logging units). South of the study area is a mosaic of fragmentation types, both natural and man made. The Anita Bay area has been extensively harvested. Southward is the congressionally-designated South Etolin Wilderness where no timber harvests are scheduled to occur.

The potential cumulative effects of future harvest in the study area may vary greatly among the action alternatives. Alternatives that include roads are more likely to include future harvests with 30% or less of the trees retained, due to cable logging restrictions. We do not know what will happen in the future, but **Alternative 1** (which does not include roads) and **Alternatives 3 and 4** (which have shorter segments of road than **Alternatives 2 and 5**) have higher percentages of helicopter logging units. Generally, helicopter logging allows retention of more large trees, thus reducing fragmentation effects. There is no guarantee, however, that any of the alternatives will have fewer miles of roads, or less fragmentation, than any other alternative in the future.

#### Species Sensitive to Fragmentation

Several species occurring in the study area are sensitive to forest fragmentation and may require minimum patch sizes to remain viable. Table 3-26 displays acreage estimates of the minimum old growth patch size necessary for effective habitat use of several species and the acres of habitat in patches meeting the minimum size requirements in the planning area. All acres listed are interior old growth, defined as volume class 4 (>8000 bf/ac) or higher and at least 300 feet from an opening. Patch size effectiveness is not synonymous with home range. Typically wildlife home ranges include a variety of habitat, some of which is used heavily, while other areas within the home range may be used little or not at all. Home ranges do not necessarily have to 100% old growth or one solid patch. The analysis of patch sizes shows that there will be patches of suitable interior old growth available to support species sensitive to fragmentation within their home ranges.

The largest block of old growth continues outside the study area to the south of Red Mountain face for a total of 5886 acres of interior old growth. Another large block of old growth continues outside the study area to the south of the Porcupine Land Unit for a total of 4661 acres of interior old growth. Since the study area is an artificial boundary, we based our analysis on the entire blocks (Figures 3-15 through 3-20).

### 3 - Affected Environment and Environmental Effects

**Alternative 6** would maintain the existing pattern of old growth in one contiguous block. **Alternative 3** would maintain the most acreage in patches meeting minimum requirements for most of the selected species. The amount of habitat available in suitable-sized patches decreases in **Alternatives 1, 2, 4 and 5**, in descending order.

*Alternative 3 would maintain the most large patches of all action alternatives.*

**Table 3-26, Estimates of Effective Patch Size (in acres) for Selected Species (and acres available under the various alternatives).**

Selected Species	Patch Size*	1954 Acres	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6
Goshawk	5,000	12,145	0	0	0	0	0	5,890
Sitka Black-tailed Deer	1,000	12,145	8,350	7,660	8,220	8,220	7,591	10,140
Marbled Murrelet	600	12,145	8,350	8,590	9,065	8,220	7,591	10,140
Hairy Woodpecker	500	12,145	8,350	8,590	9,065	8,220	7,591	10,140
Red-Breasted Sapsucker	250	12,550	8,865	9,000	9,335	9,055	7,917	10,550
Marten	180	12,550	9,050	9,000	9,335	9,055	8,382	10,550
Red Squirrel	30	12,710	9,350	9,280	9,480	9,240	8,528	10,700
Brown Creeper	15	12,710	9,365	9,320	9,525	9,280	8,626	10,700
<b>Rating**</b>			<b>c</b>	<b>d</b>	<b>b</b>	<b>e</b>	<b>f</b>	<b>a</b>

\* Minimum patch size for optimum habitat

\*\* Rating: a = least effect --- f = most effect on fragmentation sensitive species

Fragmentation of the habitat in the planning area may concentrate deer in smaller, predictable blocks of cover, which would reduce predator search time (Suring et al 1992). Much of this effect will be mitigated by the alternative silvicultural prescriptions proposed in the alternatives especially on Chichagof Face and Red Mountain. Unless there are high levels of blowdown, many of the units will not create large openings or fragment large blocks of habitat.

*Partial cutting will likely mitigate fragmentation in Chichagof Face and Red Mountain land units.*

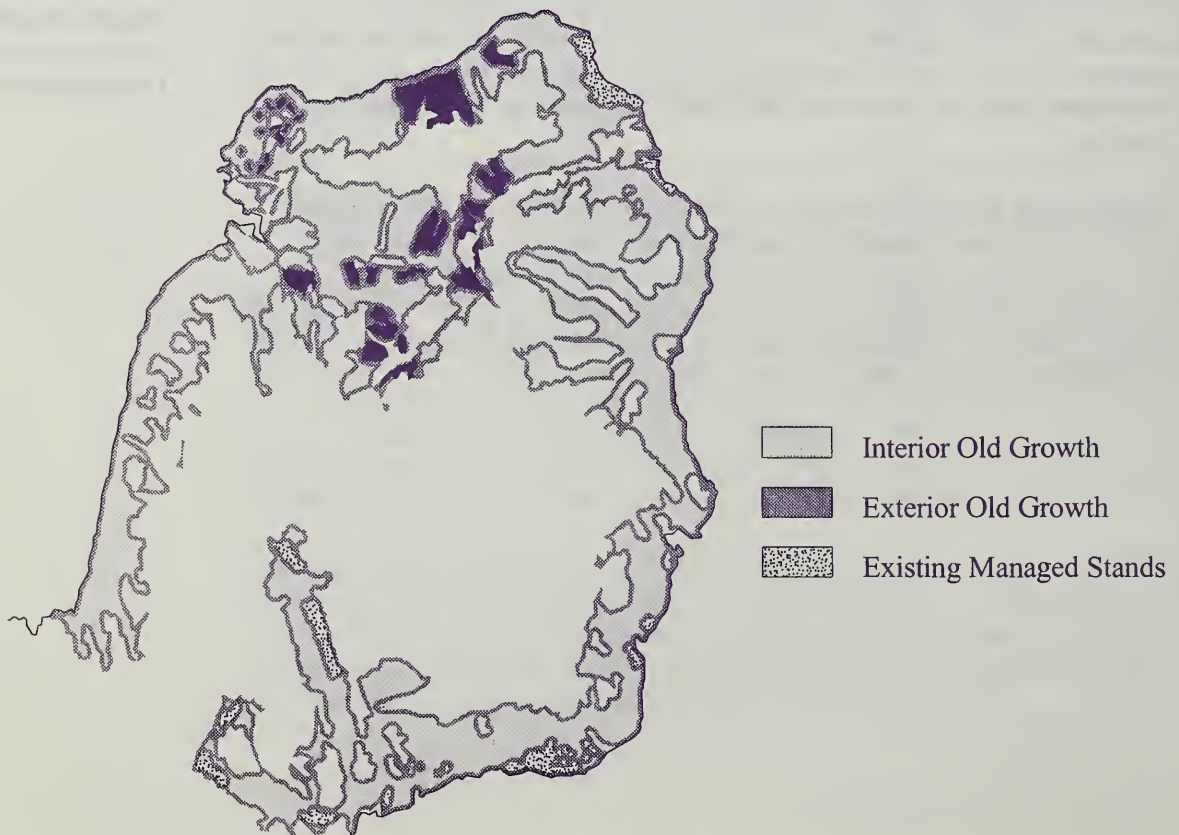
Brown Creepers prefer large old growth trees. Brown creeper habitat is best in volume class 6 and 7. Other habitats in southeast Alaska are not considered to provide suitable habitat for brown creepers. The primary effect on brown creepers by the action alternatives would be related to reduction in high volume, old growth forests. Declines in habitat capability for brown creepers and other old growth associated species are expected to occur immediately following timber harvest (Table 3-26).

### 3 - Affected Environment and Environmental Effects

Figure 3-15: Alternative 1 Old Growth Blocks



Figure 3-16: Alternative 2 Old Growth Blocks



### 3 - Affected Environment and Environmental Effects

Figure 3-17: Alternative 3 Old Growth Blocks

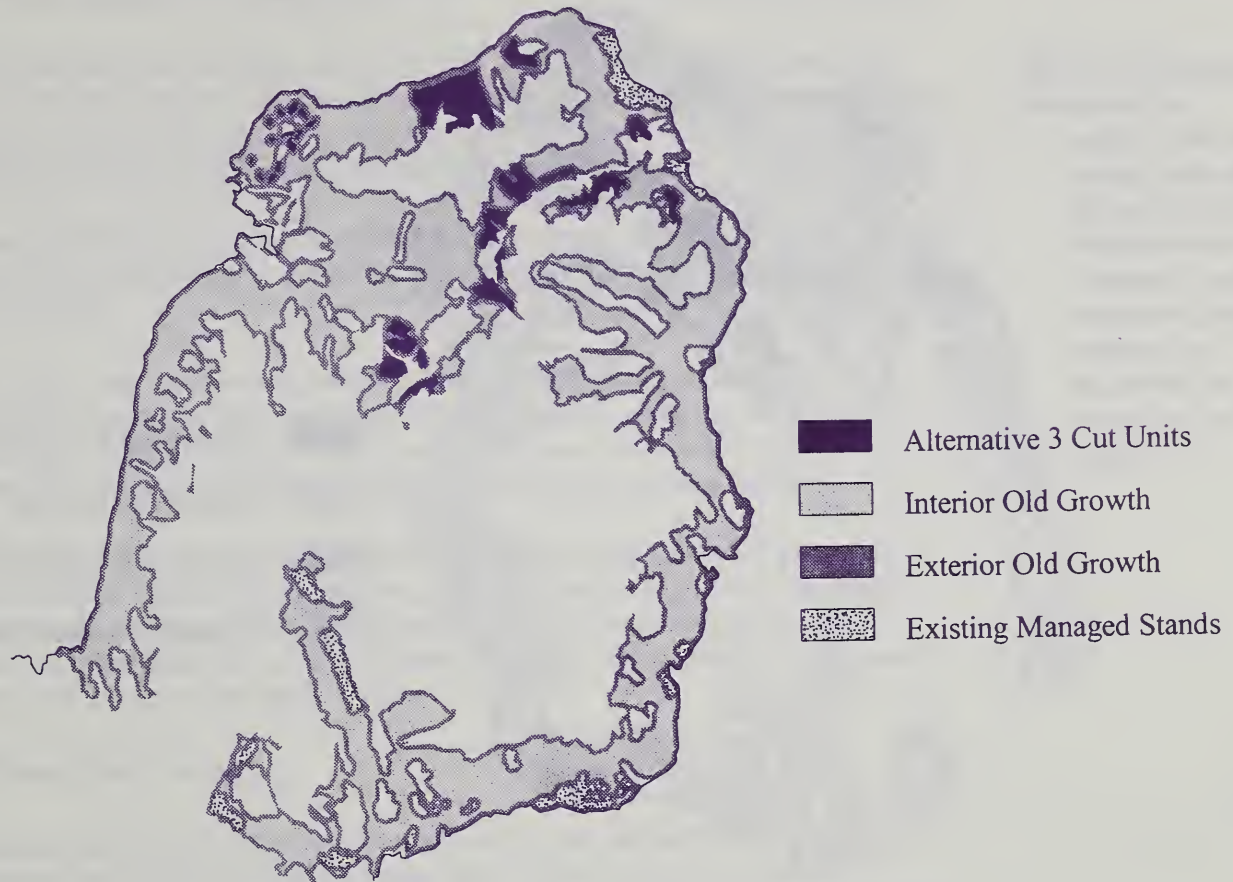


Figure 3-18: Alternative 4 Old Growth Blocks



### 3 - Affected Environment and Environmental Effects

Figure 3-19: Alternative 5 Old Growth Blocks

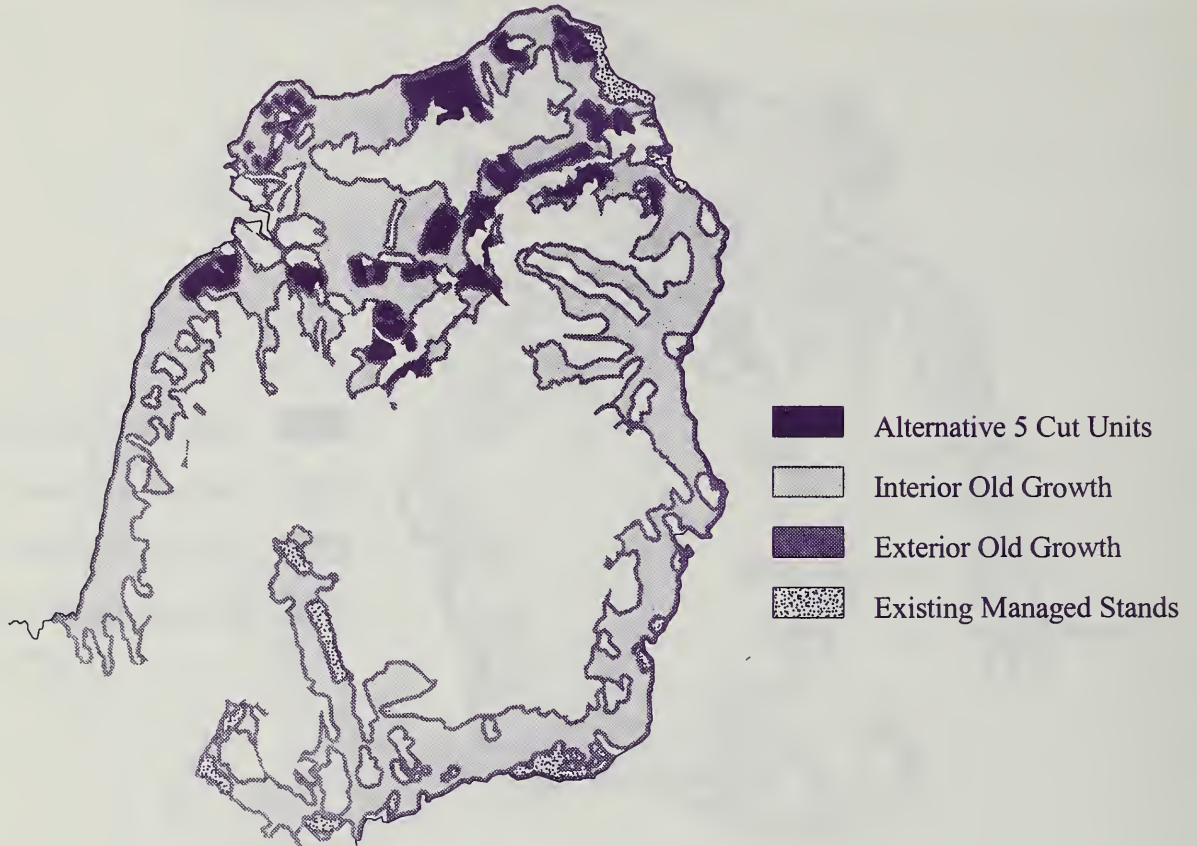


Figure 3-20: Alternative 6 Old Growth Blocks (Existing Condition)



### 3 - Affected Environment and Environmental Effects

#### Old Growth Habitat Retention

Much of the old growth in the planning area will not be harvested during the first entry. The decision on which stands of old growth will remain unharvested will affect the habitat of many species of wildlife and will have implications for future population viability. Old growth habitats would be maintained in the planning area in three primary ways.

The first would be through meeting habitat retention requirements in the current Tongass Land Management Plan (TLMP). Retaining large blocks of old growth are especially valuable to wildlife.

The second major way in which old growth habitat would be managed is through the maintenance of stream side, estuary, and beach fringe habitats. Although these habitats usually will not be in block configurations, they will provide vital travel corridors between the old growth blocks along with thermal, hiding, and foraging habitat.

The third manner in which old growth habitat will be maintained is on lands that are unsuitable for timber harvest. These areas are either too steep to harvest without risk to site productivity or are not available for timber harvest under current technological constraints. All of the acres of the various habitats discussed are essentially in old growth condition and lay in a mosaic of habitat types.

#### TLMP Retention Areas

To help mitigate effects on wildlife, a system of retaining harvestable old growth for wildlife habitat was developed under the Forest Plan. Current TLMP direction for designating retention areas is as follows:

"Areas allocated to retention should: meet objectives as designated by individual species, retention areas should not overlap, these areas should be placed in operable CFL (commercial forested lands - volume class 4 and above) and not be located on high hazard soils."

Table 3-27 shows the percentage and numbers of harvestable acres that must be retained for each habitat category. Figure 3-21 shows the location of recommended retention areas and the cutting units.

*Old Growth habitats are maintained by:*

- *setting aside larger blocks in the King George and Red Mountain land units,*
- *streamside, estuary and beach fringe habitats, and*
- *no harvest on lands unsuitable for timber production.*

### 3 - Affected Environment and Environmental Effects

Table 3-27: Retention As Defined In TLMP For The King George Sale Area.

Code	Original Acres	% to Retain	Acres to Retain	Acres Retained/ Mapped
41 - bear beach	686	15%	103	108
42 - bear estuary	226	85%	192	*139
43 - bear riparian	649	20%	130	130
45 - deer high elevation	4,951	5%	248	286
46 - deer low elevation	3,041	5%	152	190
48 - moose	853	15%	128	129
49 - furbearer upland	6,467	15%	970	970
50 - furbearer beach/riparian	1,525	20%	305	306
51 - landbird	7,992	5%	400	486
56 - low density eagle nest trees	281	65%	183	187
58 - high density eagle nest trees	438	100%	438	**342
<b>Total</b>	<b>***7,992</b>	<b>N/A</b>	<b>3,249</b>	<b>3,273</b>

\* --did not meet bear estuary goal due to 18 acres of pre-TLMP logging and 69 acres allocation to high density eagle nesting retention (Code 58).

\*\*--did not meet high density eagle nesting goal due to 96 acres of pre-TLMP logging

\*\*\*-- not a column total due to overlap between types

#### Habitat Conservation Areas (HCA)

Habitat conservation areas (HCAs) are areas designed to meet minimum viable population demands for a selected group of wildlife species proposed in "A Proposed Strategy for Maintaining Well-Distributed, Viable Populations of Wildlife Associated with Old growth Forests in Southeast Alaska-report of an Interagency Committee" (VPOP) (Suring et al 1993).

Thomas et al (1990) provided general guidelines for the development of a conservation strategy based on the work of Diamond (1975), den Boer (1981), Harris (1984), Noss & Harris (1986), and Wilcove et al (1986). In the King George planning area, the interdisciplinary team (IDT) used most of those ideas for the overall landscape-level conservation strategy. While not designating "HCAs" the team has followed Stikine Area direction to design areas of old growth retention to maintain the viability of all dependent old growth species following recommendations in VPOP.

The Interagency Committee's report (VPOP) identified potential large and medium Habitat Conservation Areas, and recommended designation of small (1600 acres or more) HCAs by area planners. We analyzed three potential small old growth habitat retention areas in the Land Units of Honeymoon, King George and Red Mountain. The King George and Red Mountain Land Units have higher wildlife habitat value than the Honeymoon Land Unit and were therefore selected for the retention of old-growth. The Honeymoon unit contains the best site for a log transfer facility, which means a road is likely to bisect the block, thus reducing the effectiveness of the area as suitable habitat. We evaluated a possible network of large, medium and small blocks of old growth over Etolin Island (see Appendix A).

We suggested that some of the habitat retention requirements should be met in two blocks, one in the Lower King George Land Unit and the other in the Red Mountain Land

### 3 - Affected Environment and Environmental Effects

Unit. The team selected the Lower King George area due to the structural complexity, biodiversity and large, contiguous blocks of high volume old growth. The Red Mountain block will provide a link between old growth blocks in the planning area and old growth blocks to the south.

*The Red Mountain block provides a link to possible old growth blocks south.*

For purposes of this analysis, these old growth areas will be useful to evaluate effects of alternative application on the ecosystems in question, their dependent organisms, and potential biodiversity.

**Figure 3-21: Retention in King George Study Area**



### 3 - Affected Environment and Environmental Effects

The Red Mountain old growth retention area would have a harvest unit (unit 28) just north of it in **Alternatives 1, 4 and 5**. The harvest unit may separate the retention block from other old growth blocks in the study area, but would not otherwise affect its old growth habitat values. These old growth habitats will contribute to the abundance and variety of wildlife (biodiversity) on the island. The old growth retention area in the King George land unit would have some patch cuts north of it under all action alternatives (Unit 1) and there would be a road and cutting units along the southern edge under the proposed action, **Alternative 5 and 2**. The road and harvest units would reduce the value of the King George land unit retention area by fragmenting old growth adjacent to it, but would not otherwise affect habitat values within the old growth retention block. Closing the road after harvest would partially retain habitat values but it is likely that the road will still invite more use than under **Alternatives 1, 3 and 4**.

#### Travel Corridors

Travel corridors provide connectivity between blocks of old growth forest. Travel corridors that extend from north to south are especially important, due to the shape of Etolin island. Corridors are delineated and retained to help maintain the biodiversity of the area, reduce fragmentation and maintain travel avenues. When these important areas are found and cataloged, decisions are made concerning their importance. Several natural corridors occur in the King George area. The west side of the planning area supplies a habitat corridor to the rest of the island through its extensive beach fringe.

*Low elevation passes are 'pinch points' to wildlife. There are three in the area.*

A concern in the island geography of southeast Alaska is "pinch-points." One type is an area where two bodies of water come together leaving only a small isthmus of land (a bridge) almost bisecting an island. The same effect can be realized with natural corridors between drainages. These areas are natural funnels for migrating animal populations and many predatory animals may choose to hunt in such areas. Both types occur on Etolin, but only the second kind occurs on the study area, as low elevation passes.

*The Kunk Lake pass is mostly unaffected.*

Three low elevation passes are located in the project area. Two are timbered passes between the planning area and the next watershed south. The pass into the Kunk Lake drainage is timbered but, it connects to a large open area with a mixed conifer/muskeg complex. Stringers of timber occur in this muskeg complex, improving the value of this corridor. None of the alternatives would directly affect the pass itself, or the Kunk Lake drainage. Harvest units and roads created under **Alternatives 2, 3 and 5** would affect animal movement patterns on the east side of the pass, but the corridor should continue to be used. Under **Alternatives 2, 3, 4 and 5**, hikers and hunters might begin to use this corridor since road access may make it easier. This may result in occasional displacement of wildlife using the corridor, but human use is not expected to be heavy since people would still need to hike several miles to Kunk Lake.

*The Fishtrap pass is designated as retention and is unaffected.*

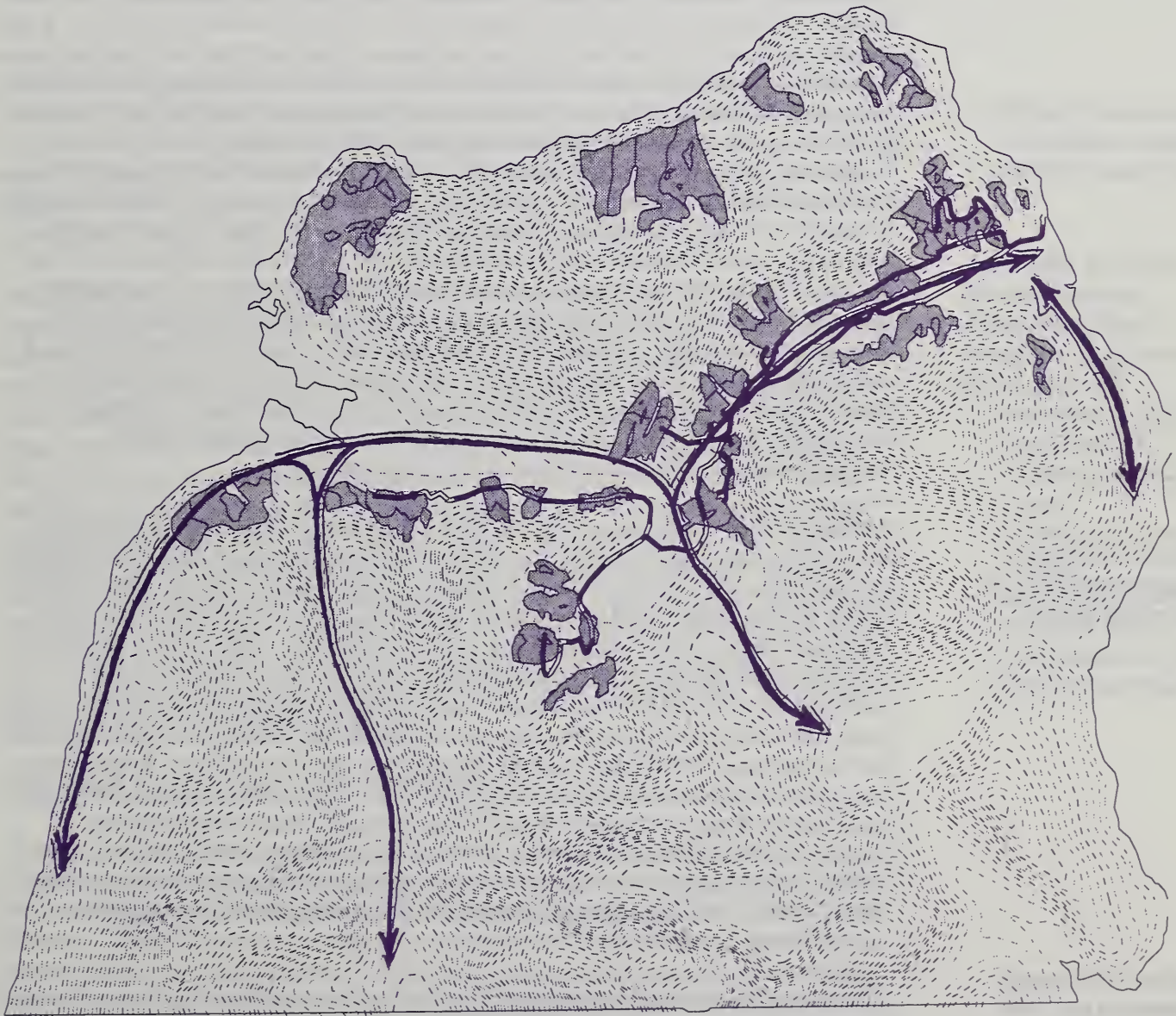
The pass between King George and Fishtrap watersheds (south of the King George estuary) is well forested and would not hinder any of the species that would use this pass. Small mammals, amphibians and large mammals should find this corridor very accessible. This project would not affect the pass itself, or the watershed to the south, although past road construction and harvest in the Fishtrap watershed have already affected this corridor. **Alternative 1** would have the most potential impact, since Units 27 and 28 are near the corridor; however, the high amount of retention in those units should maintain the integrity of the corridor. Unit 28 is also included in **Alternatives 4 and 5**. **Alternatives 2, 3, and 6** would not have any effect on this corridor.

### 3 - Affected Environment and Environmental Effects

The third low elevation pass is located between the King George and Honeymoon Creek watersheds. The road location in the pass between King George and Honeymoon creeks impacts this corridor under all alternatives except **Alternatives 1 and 6**. Roads can be very disruptive to animal movements and mitigation measures, such as road closure or hunting and trapping restrictions, may help mitigate this problem. The road would be closed under **Alternative 5**, but the corridor would be disrupted by the many harvest units proposed. Road use and timber harvest, and impacts on the travel corridor, would increase with **Alternatives 4, 3 and 2**, in that order.

*All roaded alternatives affect the pass between Honeymoon and King George Creeks. Road closures can help mitigate the effects.*

**Figure 3-22: Wildlife Travel Corridors in the King George Study Area**



### 3 - Affected Environment and Environmental Effects

#### Overall Effects Related to Fragmentation and Travel Corridors

*All alternatives help maintain the highest value block near the King George estuary.*

Overall, the fragmentation effects are least in **Alternative 6** (no action) and increase in various ways in **Alternatives 1, 3, 4, 2 and 5**. The action alternatives tend to create more patches of smaller size than are found in the existing condition. All of the alternatives maintain a block of old growth near the King George estuary and include the same harvest units along Chichagof Face. The block of old growth near King George estuary has the highest value wildlife habitat in the study area for most species. Important habitat types in the old growth block include riparian and estuary fringes, anadromous fish streams, south facing deer winter range, and corridors connecting the block to other old growth habitat. Therefore, the most important effects of fragmentation can be related to how the old growth block near King George estuary is affected. This is not to say that the Honeymoon drainage and Chichagof face do not also provide high value wildlife habitat. The habitat values of these areas were analyzed as part of the whole study area in other sections of this document, such as the discussions on corridors and management indicator species.

*Of the action alternatives, Alternative 1 maintains the most travel corridors.*

**Alternative 1** would maintain a larger block of old growth near the King George estuary than just the actual retention area, with only natural openings in the block. Corridors would be maintained to the Kunk Lake medium old growth retention block, the Honeymoon watershed and Chichagof Face. Corridors to Fishtrap watershed and Red Mountain would be interrupted by Units 27 and 28. Partial cutting prescriptions in Units 27 and 28 could result in continued travel through the units by many wildlife species. **Alternative 1** would maintain the most acreage in blocks larger than 1000 acres and has the second highest rating for acreage maintained for species sensitive to fragmentation shown in Table 3-26. To compare the average size of the old growth blocks between alternatives, we used the weighted mean block size (Kramer, in press), which is defined as  $\sum (\text{patchsize}/\text{total forest area}) * \text{patch size}$ . **Alternative 1** would maintain the third largest weighted mean block size, 1960 acres, compared to 5380 acres in **Alternative 6** (no action). No roads are proposed under **Alternative 1**, which helps minimize fragmentation and reduces disturbance in the old growth blocks.

*Alternative 3 reduces fragmentation the best of all action alternatives.*

**Alternative 3** also maintains a larger block of old growth near the King George estuary than just the actual retention area. Corridors would be maintained to Fishtrap watershed and Red Mountain, allowing wildlife to disperse to and from the southern parts of Etolin Island, and a corridor would be maintained to Chichagof Face. Corridors to the Kunk Lake medium old growth retention block and the Honeymoon watershed are interrupted by harvest units and roads. Partial cutting prescriptions in Unit 17 could result in continued travel by old growth associated species through the unit and the corridor to the Kunk Lake old growth block. Of all the action alternatives, **Alternative 3** would maintain the most acreage in blocks large enough to benefit the species sensitive to fragmentation (except Sitka black-tailed deer) shown in Table 3-26. **Alternative 3** does not include any roads or harvest units in the lower King George land unit, which helps minimize fragmentation and reduces disturbance in the old growth blocks. **Alternative 3** would maintain larger patches of volume class 7 than **Alternative 1**, but the patches of volume class 4, 5 and 6 would be smaller. **Alternative 3** would maintain the second largest weighted mean block size, 3120 acres.

*Alternative 4 minimizes disturbance to the King George watershed, compared to other action alternatives.*

**Alternative 4** would maintain a larger block of old growth near the King George estuary than just the actual retention area. Corridors would be maintained to the Kunk Lake medium old growth retention block, Fishtrap watershed and Chichagof Face. Corridors to the Honeymoon watershed and Red Mountain would be interrupted by harvest units and a road. Partial cutting prescriptions in Unit 28 could result in continued travel through the

### 3 - Affected Environment and Environmental Effects

unit by many species, allowing wildlife to disperse through Red Mountain to and from the southern parts of Etolin Island. Alternative 4 would maintain larger patches of volume class 6 than Alternative 3, but the patches of volume class 7 would be smaller. Alternative 4 would maintain a weighted mean block size of 3120 acres. Alternative 4 would only include road construction to the head of the Honeymoon watershed, which would minimize disturbance to the King George watershed during and after harvest.

**Alternative 2** would maintain the old growth retention block near the King George estuary, but the harvest units in the lower King George land unit would result in a block that would be 900 acres smaller than what would be maintained under Alternatives 1, 3, and 4. Only the travel corridor to Chichagof Face would not be disrupted by harvest units. Retention in harvest Units 17, 18 and 26 and the King George riparian area could allow some old growth associated species to continue to travel to and from Red Mountain, Fishtrap drainage and the Kunk Lake medium old growth block. The road and harvest units would make dispersal to and from Kunk Lake less likely than under Alternatives 1, 3 and 4. Alternative 2 would maintain a larger block of old growth in the Honeymoon watershed and Zimovia Face than the other alternatives, but the block would be isolated from other old growth blocks, unless retention in Units 2 and 29 allow dispersal across Chichagof Face and south to King George. Alternative 2 includes road construction into the Lower King George land unit, but closing the road after harvests are completed would reduce disturbances to wildlife in the old growth retention block. Alternative 2 would maintain the most large blocks of volume class 4 and 7 of any of the alternatives. Alternative 2 would maintain a weighted mean block size of 1350 acres.

**Alternative 5** would maintain the old growth retention block near the King George estuary, but the harvest units in the lower King George land unit would result in a block that would be 900 acres smaller than what would be maintained under Alternatives 1, 3, and 4. Only the travel corridor to Chichagof Face would not be disrupted by harvest units. Retention in Units 17, 18, 26 and 28 and the King George riparian area could allow some old growth associated species to continue to travel to and from Red Mountain, Fishtrap drainage and the Kunk Lake medium old growth block. Alternative 5 would maintain a weighted mean block size of 1155 acres. The road and harvest units would make dispersal to and from Kunk Lake less likely than under Alternatives 1, 3 and 4. Alternative 5 includes road construction into the Lower King George land unit, but closing the road after harvests are completed would reduce disturbances to wildlife in the old growth retention block. Since most of the harvests predicted to be conducted in this 50 year period in the study area would be done immediately under Alternative 5, there could be a longer period of reduced disturbance than there would be under the continuing harvest possibilities of the other alternatives.

*Alternative 2 would maintain the largest blocks of old growth in Honeymoon and Zimovia, but would reduce the size of the King George block.*

*Alternative 5 has the greatest effect on fragmentation and corridors. It still maintains key habitats by:*

- *retaining the King George block,*
- *retaining riparian areas,*
- *closing access to most roads,*
- *using partial cutting methods, and*
- *retaining most of the Honeymoon stand.*

### Vertical Structure and Diversity

Vertical diversity is characterized by the structure within a forest stand. Stands with trees all of the same age would have only one canopy layer and low vertical diversity. Stands with multiple layers (i.e. overstory, midstory, understory, snags, etc.) have high vertical diversity. Vertical diversity is important to wildlife, due to the increase in habitat characteristics or available niches. Vertical diversity generally increases as a stand goes through the various stages of forest succession. Harvest prescriptions that include retention of large trees are expected to leave more vertical stand diversity than traditional "even aged" management with clearcut practices.

### 3 - Affected Environment and Environmental Effects

#### Disturbance Factors

*There are four natural disturbance factors in the area:*

- *porcupines,*
- *landslides,*
- *yellow-cedar decline, and*
- *windthrow.*

There are primarily four natural disturbance factors that affect vegetation patterns in the study area: porcupines, landslides, windthrow and yellow-cedar decline.

**Porcupines** spend most of the spring and summer feeding on the ground. In the fall and winter porcupines spend much of their time in hemlock trees where they chew on the cambium layer in the inner bark. Trees that are not killed develop forks, and bole and butt scars which can introduce rot into the tree. By the time some hemlock trees reach maturity, the trees break at the location of the developing rot. Areas that have a lot of porcupine activity have jagged stumps, snags and lots of down logs which provide habitat for a variety of wildlife. There are usually lots of small openings with small hemlock trees regenerating. If the opening is greater than 1/4 to 1/2 acre in size, Sitka spruce may become established. Porcupines are affecting the entire study area.

**Landslides** or debris avalanches typically begin on hillslope depressions where groundwater is concentrated. Movement occurs when gravitational forces pulling overburden material downslope exceed the shear strength or resisting forces. Landslide debris is usually deposited at the bottom of the slope or on a bench leaving a trail of exposed soil. After a slide, red alder usually occupies the site at elevations below 1200 feet while Sitka alder usually occupies sites over 1200 feet in elevation. Gradually the alder die from being overtopped, snow breakage, or rot and are replaced by Sitka spruce, and sometimes western hemlock.

**Yellow-cedar Decline** has a largely unknown cause. The primary cause is likely an abiotic factor, probably associated with poorly drained soils or soil temperature. The decline began about 1880 on all sites but has not spread to new sites. Yellow-cedar growing on more productive sites is not declining. Smaller trees coming up under the declining canopy are mostly western hemlock. Most yellow-cedar decline areas will convert to western hemlock plant associations.

**Windthrow** occurs when shallow rooted trees are affected by strong winds. Patch size varies depending on the scale of the blowdown. Openings 1/4 to 1/2 acre in size will regenerate with hemlock. Larger openings will often regenerate to 70-80% hemlock, 15-25% spruce and 5-10% cedar. Large scale windthrow events result in stands that have 1-2 canopy layers. Smaller scale windthrow in a stand often results in several canopy layers.

#### Patches, Gaps, Feathering and Legacies.

Disturbance may create gaps that isolate forest patches. Whether a particular patch pattern and degree of fragmentation is beneficial or deleterious largely depends on the characteristics of the species using the landscape (Morrison, Marcot & Mannan 1992). For instance, marten are reluctant to cross openings and may be affected by the roads and harvest units, especially units with only 10% retention. Some effects of fragmentation can be mitigated for certain species, such as woodpeckers by leaving legacies and feathering the edges of gaps in the forest cover.

Legacies include large windfirm trees, snags and small green trees in the understory that survive natural catastrophic events such as fire or windthrow (Franklin 1989, Samson et al 1991). Legacies can be retained in harvest units by feathering a forest edge with selective trees along the unit boundary to secure the newly created forest edge against windthrow (Payne & Bryant 1994).

### 3 - Affected Environment and Environmental Effects

Feathering will channel wind above the forest canopy, thus lessening the chance of substantial losses due to windthrow. In addition, Ratti and Reese (1988) found that feathered edges result in lower predation rates on interior wildlife species than areas of abrupt edge. Legacies can also be retained within unit boundaries through patch cutting or individually marking trees for removal. In the marking guidelines, some large trees would be preserved throughout the study area to maintain red squirrel populations. Maintaining reserve trees consisting of high tree species diversity, and a representation of pre-logging tree size classes, is essential to provide foraging opportunities for bark-foraging species such as brown creepers.

*Feathered edges and legacies are designed into all harvest units to various degrees.*

Another important habitat component of forest blocks are snags for cavity nesting birds and mammals. Snags are dead trees at least 15 inches in diameter at breast height and 10 feet in height or higher (Reserve Tree Selection Guidelines R10-MB-215, 1993). The hairy woodpecker is important as a primary cavity excavator and probably, as such, is a keystone species. It creates habitat needed for other wildlife species through this cavity excavation process (Noble and Harrington 1977). Forty-two species of mammals and birds in southeast Alaska nest or den in tree cavities. Several of these species depend exclusively on cavities in the large diameter snags characteristic of old growth stands for nest and den sites. It is estimated that in southeast Alaska the snag dependent hairy woodpecker requires an average of 672 snags per 100 acres to achieve maximum population densities. The less snag dependent red breasted sapsucker requires approximately 160 per 100 acres for an optimum habitat. Based on Forest-wide plant association data, we expect there are currently more than 2,000 snags per 100 acres of forested habitat types similar to those of the King George planning area (Pawuk, W.H. and Kissinger, E.J., 1989).

Snags provide important marten den sites (Spencer, 1987). Marten use the tops of broken snags as resting sites in the summer and cavities in winter and summer. Preferred snags have been reported to range from 14 to a 49-inches diameter at breast height (d.b.h.) (Campbell, 1979, Simon, 1980, and Spencer, 1987). Large down logs are another important habitat feature. Marten use the spaces under the snow below the edges of large logs for hunting and travel routes.

**Proposed Harvest in the King George Area** tries to mimic different degrees of natural disturbance. For example:

A **clearcut** with 10% retention of trees resembles a large scale disturbance. Feathering or varying unit boundaries may help maintain wildlife habitat and help prevent blowdown of the harvest unit edge. In some units, we plan on leaving young healthy trees to provide a seed source for spruce and cedar. Clearcutting is the most effective way of reducing dwarf mistletoe and other diseases. Clearcutting has been the most common practice in southeast Alaska because it produces the highest volume of timber per acre.

*We mimic the shapes, sizes, and degrees of natural disturbance with harvest methods.*

The extended **shelterwood** with 30-50% retention of trees will resemble a large-scale disturbance, such as windthrow with a moderate amount of trees remaining. In the King George planning area this has less effect on wildlife and scenic quality than harvests with 10% tree retention.

**Patch cuts** simulate moderate levels of natural disturbance. This method can be used to create or maintain an uneven-age stand. Seed trees can be left within the openings to seed in a mix of species.

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**Group selection** harvest methods simulate small scale natural disturbance. This method can be effective in maintaining an uneven-aged stand. Group selections range from 1/4 to 2 acres in size and generally maintain canopy closure over large areas. This technique may retain the value of forest stands as thermal cover for big game or reduce fragmentation of old-growth.

**Single tree selection** removes trees from several size classes. Openings are kept small, resembling natural scattered tree disturbance. Regenerated trees grow slower due to competition for nutrients and light. This method will predominately regenerate hemlock.

*Only single tree and group selections that retain 70% of the trees would prevent fragmentation. Dispersed patch cuts may minimize fragmentation*

Only the single tree selection and group selection harvest methods that retain at least 70% of the trees or acres have the potential to maintain enough structure to minimize within stand fragmentation. Dispersed patch cuts may minimize fragmentation between stands. However, since these techniques are experimental, our fragmentation analysis above modeled all harvest units as clearcuts. Leaving 30% of the trees will develop a two storied stand, while leaving 50% of the trees will develop a two or three story stand. All treatments will benefit some species of wildlife while having detrimental effects on others.

#### Forest Succession After Disturbance

Oliver (1990) describes forest succession as follows:

1. **Stand Initiation Stage.** After a disturbance, new individuals and species of plants (trees) re-colonize the site. Stands developing after a major disturbances are described as 'even-aged' stands, since trees are assumed to have grown shortly after the disturbance.
2. **Stem Exclusion Stage.** As the trees continue to grow, the forest canopy closes, limiting the amount of sunlight reaching the forest floor. New trees do not appear and some of the existing ones die. The surviving trees grow larger in height and diameter.
3. **Understory Reinitiation Stage.** As trees die or are blown down, limited sunlight reaches the forest floor. Forest floor herbs, shrubs and young trees again re-colonize and survive in the understory, although they may grow very little.
4. **Old Growth Stage.** As trees in the overstory begin to die, understory trees will replace them, resulting in a multi-aged forest, with multiple canopy layers, which typifies the "old growth" stage.

These stages (see Figure 3-23) are useful as a means of predicting the changes in vegetation structure that are likely to occur after timber harvest using alternative silvicultural prescriptions. We expect that removal of up to 30% of the timber in groups or patches will retain much of the vertical structure that is found in the "old growth stage". Retention of 30 to 60 percent is expected to move the stand into the low "understory reinitiation stage" and above 60% into the high "understory reinitiation stage". The "stand initiation stage" would occur with the 10% retention prescription.

*About 65% of the forested land would remain unaffected through the end of the rotation. Alternative 5 would affect 33% (the highest percentage).*

#### Effects on Wildlife Habitat

It is estimated that approximately 64 percent of the forested land in the study area would remain unaffected by timber harvest activities through the end of the rotation. The percent of affected habitat varies from 20 percent in **Alternative 1** to 33 percent in **Alternative 5**. The forested habitat affected would be in various age classes following timber harvest. These acres would provide varying wildlife habitat values as the forest

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matures. Harvest of less than 30 percent of the volume is expected to have the least impact on most interior and old growth dwelling species. Maintaining multiple age classes and vertical structure within the stand should help the habitat return to its natural state much sooner, and in fact, mimics the natural windthrow events that are prevalent in southeast Alaska. The various harvest prescriptions will leave a mosaic across the landscape that will look similar to the naturally occurring landscape patterns.

In clearcut timber harvesting, forage production increases due to sprouting vegetation. This increases the quantity of forage, but not necessarily the quality or availability of forage. Under intermediate and deep snow conditions, deer will select those habitats that provide for snow interception and food availability. The combination of a dense canopy with scattered openings in old growth forest types allows forage growth under openings while the canopy modifies snowfall sufficiently to promote forage availability and movement of deer. The nutritional value of plants grown in partial shade is also higher than that of plants grown in full sunlight (Hanley, et. al. 1989).

Breaking up a continuous forested habitat by clearcutting has the potential to increase bear populations by creating foraging areas with abundant preferred foods (Erickson, 1965; Meehan, 1974) during the "stand initiation stage". The increased food supply on any given clearcut is short-lived. Canopy closure during the "stem exclusion stage", at age 15 to 30 years severely reduces available food supplies. Bear population increases caused by logging may be expected to decline as second-growth stands enter the phase of least forage production (Meehan, 1974).

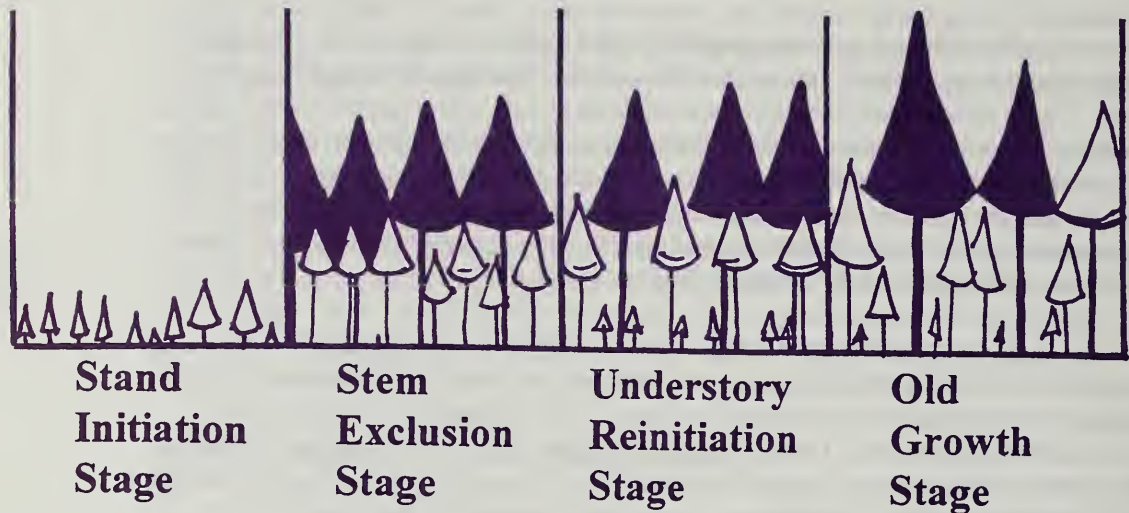
Precommercial and commercial thinning prolong forage production by opening the canopy of the young stands. During the "understory reinitiation stage", hiding and thermal cover values of the maturing stand will increase. Finally, in the "old growth stage" the forest returns to the multi-layered forest conditions most people describe as old growth with the large, old trees dying and being replaced by other trees in the understory.

In prescriptions that leave varying amounts of overstory, these changes are expected to be drastically different. In some cases, for example a 70 percent tree retention, we do not expect the difference to be noticeable, since much of the vertical structure will be maintained. In others (i.e. 40 percent or less stand retention) conditions will differ and effects will be noticed for some animal species but not for others. Presently we cannot quantify these differences, but we can predict some animal species response to the treatments. For example, marten will reduce use in areas with more than 70 percent of the overstory removed and will not cross clear areas greater than 100 feet. We also know deer utilize habitats where forage production remains even if portions of the overstory have been removed, either through natural occurrences (i.e. windthrow), harvest, or thinning activities. At Thomas Bay (located about 45 miles north of the study area on the mainland), deer and moose use have increased in partially cut units. "Both deer and moose showed similar trends in spring pellet-group counts with the lowest densities occurring in the old growth controls and the highest densities occurring in the 40 percent partial harvest" (Doerr, 1995).

*Maintaining a balance of accessible foraging areas and old growth habitats over time can benefit larger game species.*

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Figure 3-23: Schematic Stages of Stand Development following Major Disturbance



#### Threatened, Endangered, Sensitive and Special Emphasis Species

*This project will not affect threatened or endangered species.*

Biological Assessments were conducted to evaluate the effects of the proposed action on federally-listed threatened or endangered species. The Biological Assessments were submitted to the Fish and Wildlife Service for the American peregrine falcon and to the National Marine Fisheries Service for the humpback whale and Steller sea lion. Both agencies concurred with the findings of no significant adverse effects to these listed species.

Consultation with the Fish and Wildlife Service and National Marine Fisheries Service during preparation of this document identified no inventoried resident threatened or endangered species in the project area. The American peregrine falcon passes through the Forest during spring and fall migration flights but is not known to occur on the area.

Humpbacked whales and northern (Steller) sea lions both reside in the waters next to Etolin Island. The National Marine Fisheries Service has listed these species as endangered and threatened respectively under the Endangered Species Act of 1973. One known haulout for sea lions has been identified north of the King George estuary. This is a winter haulout and no rookery activity has been associated with it. No known rookeries occur on the Wrangell Ranger District and no impacts from the timber harvest or related activities are expected.

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#### Sensitive Species

Biological Evaluations (B.E.) are completed for any project that has the potential to affect a regionally listed sensitive plant or animal species. Biological Evaluations require biologists to provide written documentation of their judgments about whether or not a proposed management action will increase the likelihood of sensitive species becoming threatened or endangered. A summary of effects on sensitive plant species is located under "Other Issues" at the end of this chapter.

The following species have been classified as sensitive on the Tongass National Forest and may occur in the analysis area: Peale's peregrine falcon, osprey, Queen Charlotte goshawk, and trumpeter swan. Only the goshawk is expected to occur in the analysis area for extended periods of time.

#### Goshawk

Goshawks are raven sized raptors associated with forests having tall dense canopies. Goshawks hunt beneath the canopy, typically foraging over a range from 6000 to 8000 acres (Crocker-Bedford, 1990). Goshawks use a variety of habitats throughout southeast Alaska; however, they prefer old growth forests. A study of goshawk ecology and habitat relationships on the Tongass National Forest (Titus et al, 1994) reported that 92% of radio collared goshawk relocations were in productive old growth (volume class 4-7). Only 1% of the relocations were in young, second growth forests. Maintaining a large tree component in second growth stands through alternative silvicultural prescriptions may result in more use of second growth stands by goshawks in the future. Although goshawks prefer productive old growth, over 40 percent of all habitats used by goshawks are in areas of old growth forest types not suitable for harvest activities (Iversen, in publication).

Goshawks are uncommon in this region and there is an apparent association between timber harvest activity and decreasing goshawk nesting habitat. The northern extent of the Queen Charlotte Goshawk range is the Taku River in southeast Alaska (Webster, 1988). Eighty-one percent of the confirmed and probable nest sites in southeast Alaska are south of Frederick Sound (Queen Charlotte Goshawk Statue Report for R10 Sensitive Species Consideration, USDA Forest Service, 1991).

Field surveys in portions of the King George study area were completed in 1993, 1994 and 1995 field seasons, following the Regional protocols for the northern goshawk. Surveys were conducted before some of the proposed harvest units were designed, so many units were not surveyed. There were survey points in units 1, 6, 22, 28 and 29 and near units 3, 4, 5, 17, 20, 23 and 26. No goshawks were found during the surveys.

*Field surveys have not confirmed any goshawk nests.*

A goshawk was observed in the analysis area in 1994. No known nests have been recorded in the analysis area. There is a known nest site south of the study area. Unit 19 is the closest to that nest (within 34,000 feet or 6.4 miles). Other units (15, 20 - 28) are also within the proposed nest buffer area (Goshawk Environmental Assessment, in preparation).

Evidence of a possible nest area was found near a unit that was not surveyed, after the breeding season in 1995. The suspected nest may be in one of the units proposed to be harvested with 10, 30 and 50% retention under **Alternatives 2 and 5**. The area was surveyed on June 28, 1996, using a recorded goshawk call. There were no responses. If future surveys verify an active goshawk nest, current direction (which is the "Interim

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Habitat Management Recommendations for the Northern Goshawk, Tongass National Forest 1992") will be initiated. Mitigation measures include no vegetation manipulation in a 20-30 acre nest area, which would eliminate a harvest unit in **Alternatives 2 and 5**. Mitigation measures also prescribe a 600 acre post fledging area where created openings are less than 20 acres, which could alter silvicultural prescriptions for 2-4 other harvest units. Table 3-26 on page 3-55 indicates that implementation of any of the action alternatives would fragment goshawk habitat such that there would be no patches of old growth larger than 5000 acres. The cumulative effect of fragmenting large blocks of old growth could affect the viability of goshawks on Etolin Island over time. However, if the mitigation measures in the "Interim Habitat Management Recommendations for the Northern Goshawk" are implemented, along with the reserve strategy described in Appendix A, we should maintain goshawk population viability and not make the species more likely to be listed as Threatened or Endangered.

*Silvicultural prescriptions should help maintain goshawk habitats in the study area.*

The range of silvicultural prescriptions should maintain goshawk habitats throughout the study area. Varying degrees of forest structure should be maintained in most of the proposed units over time. Small areas will be reduced in habitat value, but they should return to suitable habitat in a short time. **Alternative 6** would have the least effect on habitat. Of the action alternatives, **Alternative 1** would have the least effect on goshawk habitat, followed by **Alternatives 4, 3, 2 and 5** in order of increasing effects.

#### Special Emphasis Species

##### Marbled Murrelets

Marbled murrelets are listed as a threatened species in Washington, Oregon and California and attention to this special emphasis species is increasing in Alaska. The marbled murrelet is a robin-sized seabird that is found throughout the North Pacific. It feeds in near-shore ocean areas, inland saltwater and occasionally on inland freshwater lakes. The bird feeds below the water's surface on small fish and invertebrates.

Marbled murrelet habitat requirements' are not well established for southeast Alaska. It is known that marbled murrelets usually nest on high branches of large trees, often far from water. Many large trees with lichens and moss on their limbs occur in the King George planning area and provide potential habitats for nesting murrelets. Some trees in the analysis area have been damaged by porcupine feeding and wind-snap. This has produced potential perch and nesting habitat for marbled murrelets.

There are no nest records of marbled murrelets on Etolin Island. However, since marbled murrelets nest on high branches of large trees they are difficult to detect. During the 1993 and 1994 field seasons, surveys were conducted in high probability areas (Honeymoon estuary and King George estuary) using Paton et al 1990, guidelines for surveying marbled murrelets in forested sites. Marbled murrelets were observed flying and circling over the planning area at both drainages. Twenty-nine murrelets were observed in three days of surveys in 1993. Their behavior may indicate nesting in the study area.

*Silvicultural prescriptions maintain trees with larger limbs, which are important to marbled murrelet nesting.*

If a nest site is found, a 30-acre radius buffer surrounding the nest will be provided. Roads can enter this buffer if unavoidable, but every effort should be made to protect the nest site. It is known that marbled murrelets prefer late-successional forested stands or old growth, with large diameter limbs covered with moss and lichen for nesting areas. With the silvicultural prescriptions used in this Environmental Impact Statement, such trees will be retained to varying degrees in most treatment areas, possibly mitigating many of the effects on murrelet habitat.

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Table 3-26 on page 3-55 shows that patches of old growth suitable size for marbled murrelets will be maintained under all of the alternatives. The No Action alternative will maintain the most marbled murrelet habitat followed by **Alternatives 3, 2, 1, 4, and 5** in order of decreasing habitat availability. Table A-1 in Appendix A shows that blocks of habitat will be maintained throughout Etolin Island even after implementation of the 10 year timber sale plan. Over the span of a rotation, it is unlikely that many patches of suitable habitat will be maintained outside of the old growth reserves but, the reserves should maintain habitat for at least a minimum viable population of marbled murrelets.

#### Alexander Archipelago Wolf

Based on the analysis of the effects on prey species (page 3-76 and 3-78), we anticipate that the silvicultural prescriptions proposed for this planning area will result in little disturbance to wolf populations. The No Action alternative would have the least effect on wolf prey, primarily deer, followed by **Alternatives 1, 4, 3, 2, and 5** in order of increasing effect. However, with the potential increase of human use in the area due to the new LTF and roads, harvest of wolves on the King George area may increase. The amount of increase in wolf harvest will vary according to the number of road miles and post-harvest management planned for the roads in the various alternatives. The alternatives with the most miles of road will have the greatest potential to increase wolf harvest. Road closures would reduce the potential wolf harvest; however, we anticipate that most of the potential harvest will be incidental take by people hunting other game species, and even closed roads provide walking corridors that will be used by increasing numbers of hunters. The no action alternative would have the least effect on wolves, followed by Alternative 1, since access to wolves would be primarily along the shoreline. Access, in addition to the shoreline, would be increased by 5.3 miles of road in Alternative 4; 7.7 miles of road in Alternative 3; 10.8 miles of road in Alternative 2 and 12.7 miles of road in Alternative 5. The vulnerability of wolves to harvest would increase with increasing road mileage.

*Effects on wolves increase with the number of open roads.*

#### Waterfowl and Cranes

Although field surveys were not conducted specifically for waterfowl, Canada geese were observed in many of the muskegs in the project area. And, a nest was found near the beaver ponds in Upper King George. Sandhill cranes were also observed in the muskegs in the Upper King George valley. No important molting or waterfowl concentration areas were found in the muskegs or beaver pond area. The wetlands that will be affected by roads do not appear to be of significant importance to large numbers of waterfowl. The riparian buffer will protect habitat for waterfowl such as harlequin ducks. The estuaries at the mouth of King George creek and Honeymoon creek are extensively used by a variety of waterfowl. The estuary buffer zones and placement of the LTF should minimize most of the effects of timber harvest on waterfowl. Helicopter yarding of unit 28 may displace waterfowl in the King George estuary for about two weeks.

#### Management Indicator Species

Several "Management Indicator Species" (MIS) were identified for additional evaluation. These species are termed indicator species due to their importance to the ecosystem and humans, and as an indicator of habitat quality. A species can be called an indicator species for a variety of reasons. They may be threatened or endangered; commonly hunted, fished and trapped; or non-game species of special interest. Most importantly they represent a variety of other species with similar habitat requirements. This is

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consistent with the National Forest Management Act that requires that management indicator species be identified for each national forest and be used for environmental analysis.

The species selected include: Sitka black-tailed deer, black bear, marten, red squirrel, hairy woodpecker and brown creeper. The habitat types represented by the Management Indicator Species are shown in Table 3-28. Bald eagle and otter were not chosen because management activities will not affect their habitats. The ability of the study area to support the selected indicator species was analyzed using a Geographic Information System (GIS) computer habitat capability models developed for the Tongass Forest Land Plan (TLMP) revision effort. These models provide an objective method for habitat evaluation and displays the effects of proposed management activities.

The no-action alternative, would have no direct effect on any Management Indicator Species and would maintain the habitat in its present condition. All proposed action alternatives include harvesting, and most include road construction, in wildlife habitat of various quality. Many proposed harvest units are common to two or more of the action alternatives. The spatial locations of impacts shift throughout the analysis area as harvest units are added or subtracted by alternative. Additionally, the use of prescriptions other than clearcutting are likely to reduce major impacts on the suitability of that habitat.

Due to model limitations, and to allow for the possibility of natural events such as blowdown in partial cut units, we modeled all harvest activity as a clearcut. Thus, the reductions listed here are used as a "worst case scenario". We predict that there will be greater use of partial cuts by Management Indicator Species than of clearcuts, so we expect less impact under the unevenaged prescriptions than have been modeled here.

*We modeled all units as 'clearcuts', but expect less effects as a result of partial cutting.*

Habitat suitability analysis was performed on two data sets to assess the distribution of old growth forests on North Etolin Island; TIMCLU and Thematic Mapping based vegetation maps. Habitat suitability index (HSI) models were run on each data set for the six selected indicator species to compare differences both in total suitable habitat, and the spatial distribution of that habitat. There was little difference between the outputs based on whether Thematic Mapping or TIMCLU was used. Therefore, only the final TIMCLU based HSI scores are reported here. A more complete discussion can be found in the wildlife specialist report.

#### Use of The Model for Alternative Comparison

We have assumed that a reduction in HSI scores is directly related to a reduction in carrying capacity. To understand the effect of habitat changes on populations, HSI scores need to be linked to mortality, natality, habitat patch size, emigration and immigration estimates. Furthermore, to predict a future population, information on the population's current density and age and sex composition is also required. In short, we are unable to predict wildlife populations into the future, except in the most general of terms.

Wildlife models, are best suited for comparison of alternative land management proposals. Model outputs should be viewed as an index of risk used to rank planning alternatives. For example, the statement "the model predicts a habitat capable of supporting 324 animals in Alternative 1" would be misleading. This implies that the model has displayed the ability to predict habitat capability for animal numbers. Conversely, the statement "of the five alternatives, Alternative 1 has the highest habitat capability score" is more useful. This correctly implies that habitat features associated with animal use will be more abundant in Alternative 1.

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Models used as a tool for management decisions are important. They should be recognized as only one of several sources in the analysis process to identify specific project effects. Knowledge concerning each species and their various habitat needs improves with field validation over time and adds to the reliability of model predictions.

**Table 3-28: Wildlife Management Indicator Species for the Study Area**

Species	Habitat Feature and Primary-Use Zones
<b>Black Bear</b>	Sensitive to human interaction; Both black and brown bears (limited numbers) inhabit the study area, use a variety of habitat types for forage, denning, and cover. Beach fringe, estuary, riparian and upland old growth are of special importance.
<b>Hairy Woodpecker</b>	Primary cavity excavator; mature uneven age stands with many snags; Saltwater influence zone, upland forested old growth are important zones.
<b>Marten</b>	Important furbearer representing upland forested old growth; forest with large snags, and downed logs for dens and prey habitat; sensitive to fragmentation and human access; Beach fringe, riparian and upland forested old growth are important ecological zones.
<b>Red Squirrel</b>	Old growth Sitka spruce is considered optimum habitat in southeast Alaska. Middens are consistently located in close proximity to large diameter Sitka spruce. Snags are used for dens, and downed logs for food caches. Upland mixed-conifer type habitat can also be important.
<b>Sitka Black-Tailed Deer</b>	Is one of the ungulates present within the study area, the other two are moose and transplanted elk. Deer are an important game and subsistence species and an indicator for: low-moderate elevation, multi-canopied forest with forbs and blueberry in the understory; Low elevation forest, riparian, beach fringe and south-facing upland slopes.
<b>Brown Creeper</b>	Old growth >30,000 mbf, western hemlock and Sitka spruce highly preferred habitat. Nests are placed between the bark and trunk of dead/dying trees (snags); Foraging occurs primarily on live trees; Studies indicate these birds are highly sensitive to clear-cut harvest patterns.

#### Effects on Management Indicator Species

Comparative results show little difference in habitat suitability for the six indicator species among the five action alternatives. In Table 3-29 you will notice that in all cases **Alternative 5** has the most impact of the action alternatives. In most cases Alternative 1 has the least impact but in some cases there is no noticeable difference between several alternatives. It appears that the direct impacts of the action alternatives will not preclude healthy populations of wildlife. Over time, the cumulative impacts of harvest on Etolin Island may greatly reduce populations of old growth associated species. The old growth reserve strategy discussed previously (and in Appendix A) should maintain at least minimum viable populations over time. Table 3-29 includes a column for Wildlife Analysis Area (WAA) 1901, which is the north half of Etolin Island. The figures indicate

*In most cases, Alternative 5 has the most impacts on wildlife, and Alternative 1 has the least of all action alternatives.*

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the expected cumulative change from the original condition after 50 years of Forest Plan implementation (TLMP, 1991).

#### Sitka Black-Tailed Deer

The value of habitat for deer, under varying weather conditions, is directly related to the composition, structure, and productivity of vegetation on a site. During low snow conditions, when habitat selection by deer is not significantly influenced by snow, deer will select those habitats that provide the best foraging opportunities. Under intermediate and deep snow conditions, deer will select those habitats that provide for snow interception and food availability. The combination of a dense canopy with scattered openings in old growth forest types allows forage growth under openings while the canopy modifies snowfall sufficiently to promote forage availability and movement of deer. The nutritional value of plants grown in partial shade is also higher than that of plants grown in full sunlight (Hanley, et. al. 1989).

The alternatives do not vary greatly in their effects on deer habitat capability. Alternative 5 would have the most impact on Sitka black-tailed deer, both in terms of habitat capability and due to the roads that would be constructed. Roads would increase hunter access to the area, which would increase the vulnerability of the deer. The use of All Terrain Vehicles (ATVs) for hunting is increasing in popularity and these vehicles are being transported on personal boats to the roads on Etolin Island south of the planning area. Thus, we can expect ATVs to be used on roads in the planning area for hunting and other recreation. In the past, logging roads on islands without ferry access usually became impassable, due to the growth of alder, after a decade or two without use. As the use of ATVs increases, and more people begin transporting them on boats, the use of logging roads may become frequent enough to prevent the vegetation from closing the roads. We do not know if that will occur in the King George planning area, but there is a possibility of increased access being maintained over an extended period of time and consequently, increased demand for deer, bear, and marten to harvest. Although there may be some long term changes in access, we do not expect that the increased access would reduce harvests below historic levels, and the habitat capability should be sufficient to meet some, if not all, of the increased demand for deer. **Alternative 1** would not require road construction and therefore would have the least effect on deer vulnerability, followed in order of increasing effect by **Alternative 4, 3, 2 and 5**.

Fragmentation of the habitat in the planning area may also result in the deer concentrating in smaller, predictable blocks of cover, which would reduce predator search time (Suring et. al. 1992). Much of this effect will be mitigated by the alternative silvicultural prescriptions proposed in the alternatives. Unless there are high levels of blowdown, many of the units will not create large openings or fragment large blocks of habitat.

Of particular concern is deer winter range. Units 11 and 18 are in areas of high value deer winter range. **Alternatives 3, 4, and 5** include unit 11, which has a prescription of individual tree selection with retention of 30%. This would put the stand in to the "high" understory initiation stage, which would increase forage, but would reduce the snow interception function of the overstory, decreasing the value of the stand as deer winter range. **Alternative 2 and 5** include unit 18, which is larger than unit 11, and has a prescriptions ranging from clearcut with 10% retention to individual tree selection with 50% retention. The former prescription would eliminate the value of that portion of the unit as deer winter range. The latter prescription would lower the snow intercept ability and therefore the value as deer winter range (some winter range function should remain). There are several other units located in medium value deer winter range, and as noted

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above, the greater the percentage of retention, the more deer winter range function will be maintained. Thus, **Alternative 1** would have the least effect on deer winter range, followed in order of increasing effect by **Alternative 4, 3, 2, and 5**.

#### Marten

Marten are dependent on over mature forests, including beach fringe and riparian habitats. Use of habitats by marten is related to availability of foods and cover characteristics. Marten are trapped for their fur, and would be vulnerable to habitat loss and increased trapper access.

Table 3-29 displays estimated changes in marten winter habitat capability for each of the action alternatives. As was described for deer, the Alternatives do not vary greatly in their effect on marten habitat capability. **Alternative 5** would have the greatest effect on marten, both in terms of habitat capability and due to the roads that would be constructed. Marten are reluctant to cross openings and may be affected by the roads and harvest units, especially units with only 10% retention. Although there is not currently ferry access to Etolin Island, the LTF could allow people to use boats to transport snowmachines, which could then be used to access the road system to trap marten. Low market prices are currently keeping marten harvests low, so the short term effect may not be great.

Habitat capability for marten should increase again as regenerated forests in harvest units mature. This is helped by retaining many existing large trees of different species composition through the prescribed silvicultural treatments being used on this area.

#### Black Bear

Breaking up a continuous forested habitat by harvesting timber has the potential to increase bear populations by creating foraging areas with abundant preferred foods (Erickson 1965; Meehan 1974). The increased food supply on any given clearcut is short-lived, however. Canopy closure at age 15 to 25 years severely reduces available food supplies. Bear population increases caused by logging may be expected to decline as second-growth stands enter the phase of least forage production (Meehan 1974).

Very little harvest is proposed in important black bear habitats, such as riparian, estuarine fringe and beach fringe habitats, in the action alternatives. A small decline in the black bear population can be expected as some important habitats are harvested and as hunter access increases. Even under the worst-case scenario that was modeled (Table 3-29), the habitat capability for black bear remains essentially unchanged in **Alternatives 1 and 2**. **Alternative 3, 4, and 5** would be similar in their effects on black bear habitat capability.

#### Red Squirrel

Optimum habitat for red squirrels includes forested stands with two or more conifer species of cone-bearing age for food, snags for den sites and downed logs for cache sites. These conditions are best provided in old growth Sitka spruce/hemlock forest types in Southeast Alaska. Red squirrels are widespread throughout the study area.

With the silvicultural prescriptions in place, the amount of large Sitka spruce trees in the study area and the small size of the many openings, little impact would be expected on red squirrel habitat in **Alternative 1, 2, 3 and 4** (Table 3-29). **Alternative 5** would have the most impact on red squirrel habitat capability due to the higher volume and acreage harvested.

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#### Hairy Woodpecker

Hairy woodpeckers are year-round residents in southeast Alaska and use snags and partially dead trees for nesting and foraging. The hairy woodpecker is important as a primary cavity excavator and most cavity nesting or denning species would be represented by the hairy woodpeckers and respond similarly to proposed activities. Hairy woodpecker habitats are found in stands consisting of volume class 4-7 below the subalpine.

The primary effect to hairy woodpeckers under the action alternatives would be related to the loss of high volume old growth. **Alternative 5** would have the most effect on hairy woodpecker habitat capability, a 16% reduction from the current condition (Table 3-29). **Alternative 1** would have the least effect, a 9% reduction from the current condition. Hairy woodpeckers would benefit from retention of large structures including snags and live trees with harvest units and the reduction in habitat capability may be less affected by retaining structure within units. In 1996, hairy woodpeckers nested in a snag in the middle of a harvested unit with moderate retention in the Campbell timber sale near the Bradfield Canal.

#### Brown Creeper

The brown creeper was chosen as a MIS because it is associated with large, old trees and represents the old growth forest community. Maintenance of reserve trees consisting of high tree species diversity and a representation of pre-logging tree size classes in harvest units is essential to provide foraging opportunities for bark-foraging species such as brown creepers.

The primary effect on brown creeper by the action alternatives would be related to reduction in high volume, old growth forests. Declines in brown creeper habitat capability are expected to occur immediately following timber harvest. **Alternative 5** would have the greatest effect on brown creeper habitat capability, a 14% reduction from the current condition, while **Alternative 1** would only reduce the habitat capability by 3%.

### 3 - Affected Environment and Environmental Effects

Figure 3-24: Deer HSI



### 3 - Affected Environment and Environmental Effects

Figure 3-25: Marten HSI



### 3 - Affected Environment and Environmental Effects

Table 3-29: Habitat Capability as a percentage of the current condition \*

Species	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	WAA 1901
Deer	97	94	96	96	92	100	76
Marten	95	94	95	95	90	100	68
Black Bear	99	99	96	96	96	100	82
Red Squirrel	96	95	96	96	92	100	79
Hairy Woodpecker	91	88	90	90	84	100	48
Brown Creeper	97	90	95	96	86	100	21
Rank**	b	e	d	c	f	a	

\*Models used are Suring et al, 1988 and 1992

\*\*Rank: a = least impact f = most impact

#### Effects on Special or Unique Habitats

**Beaver Ponds-** None of the alternatives will directly impact the beaver ponds located in wetland habitat at the head of the King George watershed. However, indirect effects may occur from **Alternatives 2, 3 and 5** since these alternatives construct roads near this area. Beavers are often attracted to culvert inlets as dam sites. Resulting ponds may attract other wildlife species (such as geese). As discussed in the freshwater system section, oversizing culverts, use of bridges and removal of culverts after logging may limit this effect. Increased access provided by roads may increase opportunistic taking of beavers or other wildlife. **Alternatives 2 and 5** close roads near this area, but **Alternative 3** leaves the entire road system into Upper King George open. **Alternatives 6, 1 and 4** have the least effects on the beaver pond habitat.

**Honeymoon Stand-** Within the Honeymoon Creek watershed there is a stand of Volume Class 7 timber (highest volume class with large trees). on the south-facing side. There are some small areas of Volume Class 7 timber left on the Wrangell Ranger District but this is the only upslope stand not in a riparian area. There is another Volume Class 7 riparian stand in the King George watershed which is designated to be retained as old-growth.

Often Volume Class 7 stands are designated because they have a large number of trees per acre. The Honeymoon stand is designated because of the number of large trees per acre. This stand has 3 to 4 canopy layers with large Sitka spruce in the top layer ranging in diameter from 30-60 inches 5 feet above the ground. They are estimated to be 230-450 years old from cores taken inside the tree. Tree heights are 160-185 feet. The second canopy layer is composed of western hemlock and some yellow-cedar, which range in diameter from 18-30 inches and are estimated to be 180-240 years old. This second canopy layer ranges from 70-160 feet. Most of the western hemlock has bole rot. The third canopy layer is composed of western hemlock, with small amounts of redcedar, yellow-cedar and red alder. Diameters range from 6-18 inches and their height is 30-70 feet tall. A small portion of the area has a fourth canopy layer of small western hemlock seedlings and saplings. Brush species include blueberry (26-45% cover) devils club (0-25%), rusty menziesia (0-25%), skunk cabbage (0-25%) and twisted stalk (0-25%).

The Honeymoon stand is 65 acres in size. Possible impacts of harvesting this stand include the further loss of representations of this type of habitat and loss of deer winter

*Alternatives 2, 3, and 5 may have indirect effects on the beaver ponds from road access.*

All alternatives minimize fragmentation of the Honeymoon stand.

### 3 - Affected Environment and Environmental Effects

range values if the stand is fragmented. The following describes the impacts on this stand by Alternative:

- **Alternative 1-** Does not construct road through the stand and harvests 11 acres. Fragmentation of the stand is somewhat minimized by harvesting on the east side of the stand.
- **Alternative 2-** Moves the road to the south side of Honeymoon Creek and avoids this harvest and road development in this stand. Effects are similar to Alternative 6.
- **Alternative 3-** Harvests 7 acres of the stand. Fragmentation is minimized by harvesting the 7 acres below the road.
- **Alternative 4 and 5-** Have the same impacts by harvesting 24 acres of the stand. Again, fragmentation is minimized by logging the portion below the road.
- **Alternative 6-** No impacts, the stand would likely remain intact with eventual loss of trees in the second canopy layer. Gaps would be filled by western hemlock in the third canopy layer.

*Elevational corridors on south facing slopes are maintained by unit design. Alternatives 2 and 5 harvest the most.*

**South Facing Slopes-** South-facing slopes in the King George study area provide thermal cover for wildlife. In **Alternatives 2, 3, 4 and 5**, harvest units on south-facing slopes are designed to maintain elevational corridors while minimizing fragmentation. **Alternatives 1 and 6** have the least effect on south facing slopes (Alternative 1 harvests 11 acres).

- **Alternative 2 and 5-** Harvest 210 acres in the center of the south-facing slope. This divides the block into two parts, but leaves the south-facing areas closest to saltwater unharvested.
- **Alternative 3 and 4-** Harvest 112 acres in the center of the south facing slope. This divides the block into two parts, but leaves the south-facing areas closest to saltwater unharvested. These alternatives do not harvest any of the south-facing habitat in the King George watershed.

*All estuaries are protected. Alternatives 2 and 5 propose road construction within 1/3 mile of the King George estuary.*

**Estuaries-** We discuss some of the effects to estuaries under the Freshwater system issue (Issue #3). Estuaries are important to resident and migrant waterfowl. The more productive estuaries are semi-enclosed by land. The King George planning area has two estuaries, one at the mouth of Honeymoon Creek and the other at the mouth of King George Creek. The King George estuary is larger and enclosed. All alternatives protect this estuary and wildlife values from direct impacts. **Alternatives 2 and 5** may have indirect effects from increased access since roads are located within 1/3 mile of the estuary. Road closures planned under these alternatives will help mitigate the potential indirect effects. The Honeymoon Creek estuary is also protected from direct impacts under all alternatives. Management activities are 1/2 mile from the mouth of Honeymoon Creek under **Alternatives 1, 2, 3, 4 and 5**. Indirect effects of action alternatives could include the temporary displacement of waterfowl due to the activity surrounding the log transfer site and rafts during the logging operations lasting 2-5 years.

## Other Environmental Considerations

### Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitments of resources are resources that we would impact that will not be returned or could return, but only over long periods of time. For this analysis, the irreversible disturbance of some types of cultural resources could occur on unknown sites, subsurface sites, or even known sites when unplanned events occur.

*Construction of roads and rock pits permanently commit resources.*

Use of petroleum fuels and rock sources for road and sort yard construction commits non-renewable resources. Alternatives 1 and 6 have no effect on mineral resource use at this time.

Roading the study area will irreversibly reduce the potential amount of area that could be designated as part of the Wilderness Preservation System or managed for other purposes that require natural characteristics. Roads would also commit a certain amount of acres of forest and muskeg and would eventually be converted over time to seed beds for grasses and alder. Alternatives 1 and 6 would not have these consequences.

Under all alternatives, except Alternative 6, there will be an irretrievable loss of old growth forest unless rehabilitation occurs over a period of 250-300 years. Due to increased fragmentation, other old growth areas adjacent to units would have their habitat values reduced.

### Unavoidable Environmental Effects

Although we designed mitigation measures, units, and roads to avoid adverse consequences, some impacts to the environment cannot be completely mitigated and would be expected to occur.

*Unavoidable effects will occur to some extent on air quality, sedimentation, and wildlife habitats due to increased human activity during and after logging.*

Air quality would diminish on a recurring, temporary basis due to the construction of roads (if applicable), timber harvest, and hauling. Limbs and logging slash will be burned at sort yards intermittently throughout the logging periods which will deposit minor amounts of particulate matter and smoke into the air.

Although Best Management Practices are designed to protect soil and water, some potential for surface erosion, sediment production, channel erosion, and mass movement does exist. Helicopter yarding reduces this risk considerably but road development does pose a risk of sediment production. In addition, sediment production could displace fish or result in a loss of habitat near stream crossings and temporarily affect the function of the freshwater system.

Increased human activity both during and after logging, and loss of habitat, would result in impacts to fish and wildlife species, particularly those populations which have low numbers or are more sensitive to the presence of people. The habitat for old growth dependent species would also be reduced. Travel corridors between old growth blocks in adjacent watersheds would also be reduced in size and fragmented which may affect the ability for individuals to disperse and genetic material to exchange among local populations of species.

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Although the degree of impact varies with the alternative selected, presence of logging operation would temporarily affect the use of the area by outfitter/guides, commercial fishermen, tourists, and local recreationists. There would also be some loss of primitive and semi-primitive recreation opportunities in the study area with the roaded alternatives. The natural landscape as viewed from surrounding waterways, islands, and interior alpine areas on Etolin could appear visually altered under some alternatives and may be noticeable to viewers.

Effects on air quality and sedimentation are relatively short term in nature (1-3 years) and only temporarily affect existing ecosystem functions. Others, such as the loss of old-growth habitat and impacts to wildlife populations from harvest resulting from increased human access, will be long term and could affect species diversity in the study area.

#### Alaska Coastal Management Program

*We are consistent with the policies of the ACMP.*

We have determined that the proposed alternatives, including the preferred alternative, are consistent with the Alaska Coastal Management Program to the maximum extent practicable. We have based this determination on the analysis and mitigation measures outlined in this document. In particular, we direct your attention to our methods of addressing Issues 3 and 4 (Freshwater System and Habitat Conservation), and the specific measures outlined and summarized in the Unit, Road, And Log Transfer Facility cards (Appendix B and D). We are requesting that the Office of Governmental Coordination (OGC) review our finding of consistency on Alternative 5 during the comment period.

#### ANILCA Section 810 Subsistence Evaluation Process

Section 810 of ANILCA requires a Federal agency, having jurisdiction over public lands in Alaska, to analyze the potential effects of proposed land-use activities on subsistence uses and needs. An ANILCA 810 analysis should include: an evaluation of the possibility of affects on subsistence uses; a distinct finding on whether the proposed action may significantly restrict subsistence uses; notices and hearings if the evaluation results in a finding that the proposed action may significantly restrict subsistence uses; and determinations if, following a public hearing a finding of a significant restriction remains, the responsible official decides to proceed with the proposed project.

Evaluation criteria used to assess the effects of the proposed alternatives are: (1) changes in abundance or distribution of subsistence resources, (2) supply and demand, (3) changes in access to subsistence resources, and (4) changes in competition from non-subsistence users for those resources. The evaluation determines whether subsistence uses within the analysis area or portions of the area may be significantly restricted by any of the proposed action alternatives. Wildlife, fish, shellfish, marine mammals, other foods, and timber are the resources used for subsistence that are evaluated in the subsistence report. A complete Subsistence Report has been done and is in the planning file.

#### King George Subsistence/ANILCA 810 Findings

The Findings are based on the evaluations in the Subsistence Report on abundance, distribution, supply and demand, access and competition for harvested resources in the study area, WAA 1901 and the Etolin Island area. The area is not an extensively used subsistence harvest area. There would be some decreases in habitat capability for wildlife under the action alternatives. However, the habitat would be capable of maintaining populations greater than projected harvest demand under all alternatives through the

### 3 - Affected Environment and Environmental Effects

rotation (Figures 3-26 through 3-29). The effects on finfish and shellfish populations are expected to be minimal and should not affect the supply available for subsistence harvest.

Figure 3-26, Estimated Supply and Demand for Black Bear in WAA 1901

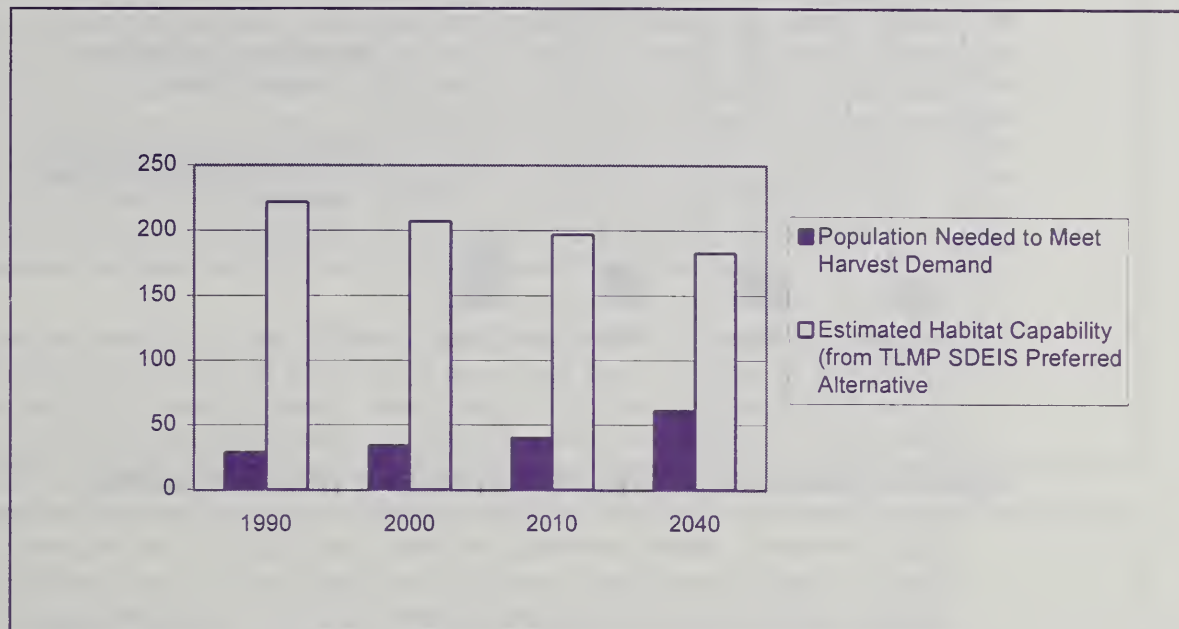
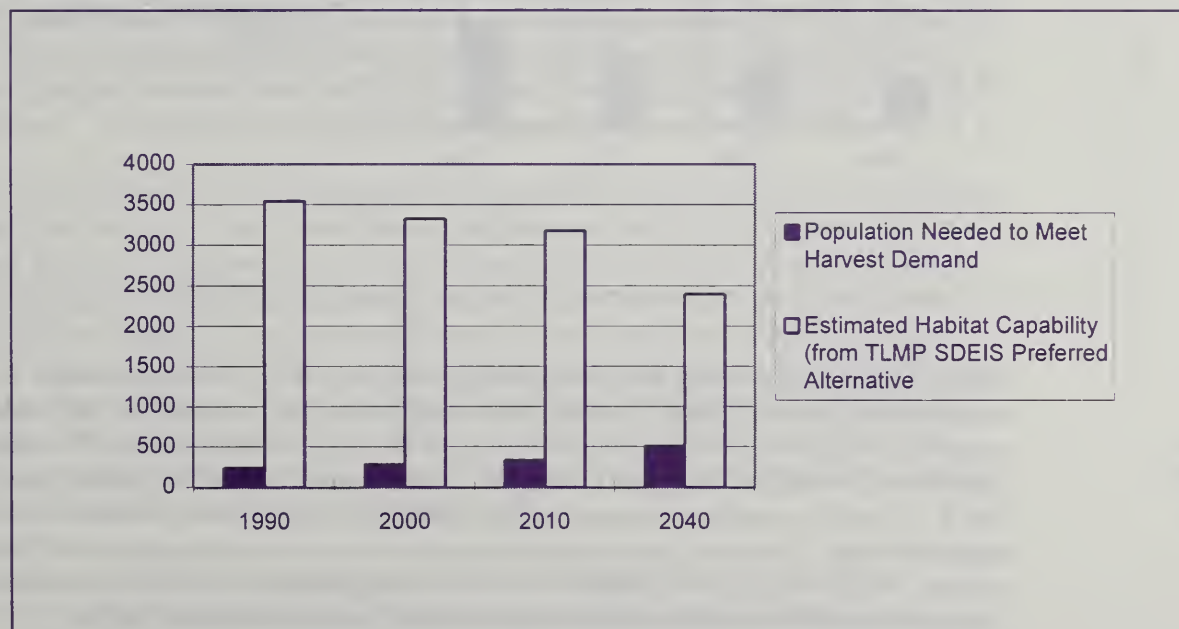


Figure 3-27, Estimated Supply and Demand for Deer in WAA 1901



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Figure 3-28, Estimated Supply and Demand for Marten in WAA 1901

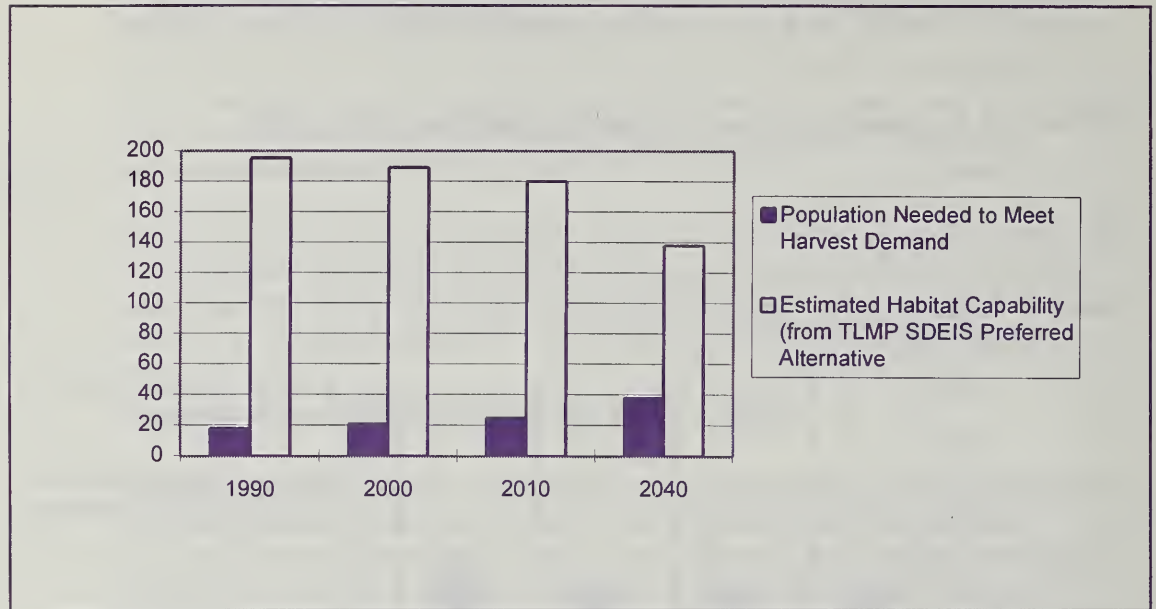
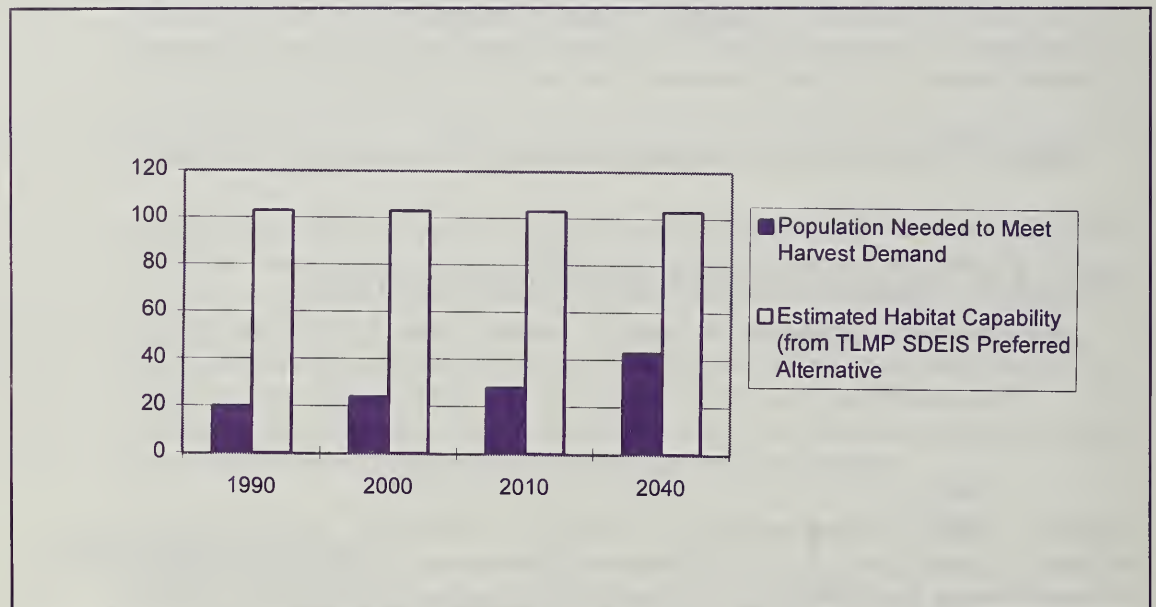


Figure 3-29, Estimated Supply and Demand for River Otter in WAA 1901



*There will not be a significant restriction on subsistence uses.*

Although there may be some long term changes in access, we do not expect that the increased access would reduce subsistence harvests below historic levels, and the habitat capability should be sufficient to meet some, if not all, of the increased demand for deer. Alternative 5 would result in construction of the most roads, followed by alternatives 2, 3 and 4. No roads would be constructed under Alternative 1, which would therefore affect access the least. Closure of roads to motorized access under some alternatives will further mitigate effect of access. A substantial increase in competition for subsistence wildlife resources from non-rural community residents is not projected to result from the alternatives proposed.

**A finding that there will not be a significant restriction on subsistence uses is in order for wildlife, fish and shellfish, marine mammals, other foods, and timber resources.**

#### Cultural Resources

The Cultural Resource Overview of the Tongass National Forest (Arndt, Sackett and Ketz 1987) and The Bitter Water People: A Cultural Resources Overview of Etolin Island, Southeast Alaska (Rabich-Campbell 1988) describe the diversity of cultural resource sites that are or have the potential of being discovered in southeast Alaska and Etolin Island. Both overviews present basic cultural and environmental contexts and themes within which we can evaluate specific site significance. They provide background information, identify gaps in the present understanding of the cultural use of southeast Alaska and serve as interpretive documents for sensitizing both the general public and Forest Service personnel to the significance and fragile nature of cultural resources. The reader is directed to those reports for a more detailed description of the cultural heritage of southeast Alaska and Etolin Island. The following description is a summary of information we gathered during an extensive literature and files search.

Cultural resources include the evidence of past human activity, potentially dating from the first occupation of southeast Alaska to the recent past. Information on the history of the region and Etolin Island is limited. Some sites in the region, including the Ground Hog Bay 2 site on the Chilkat Peninsula and the Hidden Falls site on Baranof Island, indicate the first occupation of southeast Alaska dates to nearly 10,000 years ago. The earliest cultural period in southeast Alaska, from about 8000 to 4500 B.C., is characterized by small groups of people focusing on a maritime subsistence pattern. These early people used distinctive small volcanic glass blades, known as obsidian microblades, and other tools chipped from stone. This early period is followed by one of transition, roughly between 4500 and 3000 B.C., when people changed their emphasis from chipped stone tools to ground and polished stone tools. Few sites have been dated to this transitional period and our understanding of associated lifestyles is limited.

By about 3000 B.C. it appears the environment stabilized and salmon and other natural resources became more dependable for subsistence purposes. The earliest dated site on Etolin Island, located south of the study area, was occupied between 580 B.C. and A.D. 450. By A.D. 500 a Northwest Coast culture emerged that was characterized by large winter villages, defensive sites, shell midden deposits and a preponderance of ground stone tools. This period lasted until European contact in the mid to late 1700s.

The Tlingit Indians are the most widespread and numerous indigenous group in southeast Alaska, but the point at which they first entered southeast Alaska is still speculative. The Tlingit Indians are composed of a number of kwans (loosely referred to as tribes) who's boundaries have continuously fluctuated. The study area falls within the former territory of the Stikine Tlingit, who some asserted were the most populous and powerful of all Tlingit kwans (Oberg 1973; Olson 1967). Smaller political divisions known as clans are present within each kwan. Each clan owned tangible property, such as salmon streams, berry patches, offshore waters for hunting sea mammals and catching bottom fish, and both winter and summer homes. In addition they held intangible property such as crests, house and personal names, songs and origin stories.

The mid to late 1700s marked the arrival of Russian, British, Spanish, French and American explorers, dispatched to investigate the Northwest Coast of North America. They came to lay claim to new lands for their countries, to appraise the vast natural resources and to look for a shorter trade route to China. Captain George Vancouver made the earliest European documentation of indigenous occupation on Etolin Island during his 1793 passage through Clarence Strait. Vancouver reported abandoned villages along

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Etolin Island's western shore, although he did not report encounters with any indigenous residents.

Ethnographic accounts of Etolin Island recall a rich Tlingit heritage of traditional land use, but no mention is made of specific sites within the present study area. An 1880 Alaska census lists four Stikine Tlingit villages on Etolin Island. There is no indication, however, that any of the four villages were located in the present study area.

By the mid-nineteenth century many traditional Stikine Tlingit villages, including some on Etolin Island, had fallen into neglect (Olson 1967:57). The Russian's built Redoubt Dionysius on the north end of nearby Wrangell Island in 1834. Neighboring Stikine Tlingit groups who traded at the post began to move closer to Wrangell. The movement into Wrangell continued with the Hudson's Bay Company takeover in 1849 and intensified with the American establishment of Fort Wrangell in 1867 and later missionary activity (Krause 1956:73).

Historic activity in the study area appears to have been relatively limited. North Etolin Island's relatively steep and rocky coast was probably not as conducive to human settlement and use as other parts of the island and surrounding areas. Historic activities included logging, subsistence hunting and gathering and recreation. Forest Service records indicate selective hand logging began along the coast in the early twentieth century.

#### Previous Investigations

*No sites eligible to the National Register of Historic Places will be affected.*

Prior to this study, three cultural resource field surveys had been conducted on north Etolin Island. In addition, Emmons (1908:225) reported a petroglyph site (Alaska Heritage Resource Survey Site PET-018) on the northwest tip of Etolin Island during his travels in the 1880s. Stevens (1974:2) later failure to locate the petroglyphs lead Frederica de Laguna to speculate that Emmons had actually been referring to petroglyphs on the north end of adjacent Wrangell Island (Emmons 1991:80). Sealaska Corporation investigators conducted a cultural resource survey of southeast Alaska in 1975, including portions of the study area (Sealaska Corporation 1975). A Wrangell elder reported a permanent village site within the present study area, but investigators failed to locate such a site. They did record an old garden plot in the same area (Alaska Heritage Resource Survey Site PET-103) and speculated the surrounding area was used as a seasonal fish camp. This site was not selected by Sealaska Corporation as a historic or cemetery site under provisions of 14(h)(1) of the Alaska Native Claims Settlement Act. Forest Service archaeologist Larry Roberts conducted a limited survey of portions of the present study area in 1985 (Roberts 1985), but he did not report any new sites. A Forest Service contractor evaluated two potential log transfer facilities along a small section of Etolin Island's northeast coast in 1992. The archaeologists on the review team reported no cultural resources except for one possible bark-stripped cedar, numerous springboard-notched trees (evidence of historic hand-logging) and modern camping debris (Davis et al. 1992:23-29). Most of what is known about the archaeological heritage of Etolin Island comes from Forest Service surveys conducted around Anita Bay, Burnett Inlet and Mosman Inlet.

#### Environmental Consequences

No sites eligible to the National Register of Historic Places will be affected in any of the action alternatives. Cultural resources within southeast Alaska and the Tongass National Forest may reveal important information on past environmental conditions and human lifestyles, including information related to the first entry of people along the north Pacific

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Rim. These resources are fragile and easily damaged. They are also non-renewable. Primary or direct impacts to cultural resource can include alteration to the settings of sites; alteration of above ground objects, features and structures and the spatial relationships among them; and disturbance or destruction of subsurface cultural deposits. Secondary or indirect impacts may include a higher frequency of site looting and vandalism due to increased human access to previously remote areas.

Federal laws and regulations require processes for considering the impacts of Federal projects on significant cultural resources. Major legislation related to these processes includes the National Historic Preservation Act, as amended; the Archaeological Resources Protection Act, as amended; the American Indian Religious Freedom Act; and the Native American Graves Protection and Repatriation Act. Section 106 of the National Historic Preservation Act (specified in the regulations of the Advisory Council on Historic Preservation at 36 CFR 800) outlines a process for evaluating the effects Federal projects may have on cultural resources. It involves inventorying cultural resources, determining which are significant or eligible to the National Register of Historic Places, evaluating project effects, and designing and implementing measures to negate any adverse effects that project may have upon significant resources. This process is undertaken in consultation with the Alaska State Historic Preservation Officer and sometimes with the Advisory Council on Historic Preservation, an independent Federal agency.

We recently signed a programmatic agreement with the Advisory Council on Historic Preservation and the Alaska State Historic Preservation Officer that implements a model for cultural resource site probability or sensitivity. The probability model reflects the results of about 89,000 acres of field survey conducted by archaeologists on the Tongass National Forest during the last 20 years. The model defines the high probability zone as all areas between mean low water and 100 feet in elevation. In addition, the high probability zone includes mineralized zones; river and lake systems that provide passage to or over larger land masses; streams and lakes with anadromous fish runs; fossil marine, river and lake terrace systems; karst landforms; areas associated with traditional cultural myths and legends; and raw material sources such as cedar stands and obsidian deposits. Everything not defined as high probability is considered in the low probability zone. Normally, we survey all areas of high probability and a portion of low probability areas.

Forest Service archaeologists surveyed a total of 2,940 acres during 1993 and 1994, or roughly 18 percent of the entire study area. The survey included about 620 acres of coastal fringe, 170 acres of tide flats and 2,150 acres in interior upland and alpine areas. The archaeologists walked parallel lines about 60 feet apart while conducting subsurface tests at least every 60 feet. Subsurface test frequency increased in areas where site potential appeared highest. We supplemented subsurface testing by examining exposed ground surfaces such as tree root wads, animal trails and stream cut banks. Site and survey information is on file at the Stikine Area Supervisor's Office in Petersburg, Alaska. This information is generally not available to the public because of site sensitivity to looting and vandalism. Site location information is specifically exempt from the Freedom of Information Act.

We recorded eight new sites, including four shell middens, two wood stake fish traps, one possible stone fish trap and one historic campsite. We also revisited the reported locations of the two previously reported sites (Alaska Heritage Resource Survey Sites PET-018 and PET-103). We were unable to confirm the presence of the petroglyph site (PET-018) reported by Emmons. We did locate site PET-103, previously recorded by Sealaska Corporation. Of the eight new sites and the one previously recorded, six appear to meet the eligibility criteria for the National Register of Historic Places. These include Alaska Heritage Resource Survey sites PET-343, PET-346, PET-347, PET-389, PET-398

*Eight new sites were found through field surveys.*

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and PET-399. The remaining three sites (PET-103, PET-344 and PET-345) do not appear to meet the National Register eligibility criteria. Archaeologists also recorded 68 culturally modified trees scattered throughout the study area, but none of them appear to meet the National Register eligibility criteria.

The human settlement and use of north Etolin Island is represented by nine sites and scattered culturally modified trees. The archaeological record indicates north Etolin Island was occupied during both ancient and historic times. Radiocarbon dates obtained from study area sites reflect occupation ranging from about A.D. 230 to A.D. 1100. Natural resource harvest and processing appear as the primary activities represented by cultural remains. Exploited resources include cedar, hemlock and spruce; marine invertebrates; fish; and terrestrial mammals.

A report summarizing the 1993 and 1994 field surveys has been submitted to the Alaska State Historic Preservation Officer. Copies of this report were provided to the Wrangell Cooperative Association (local Native tribe). The report indicates that six of nine known sites are eligible to the National Register of Historic Places. The report concludes that none of the eligible sites will be affected by any of the proposed action alternatives. The report's summary conclusion is that there are no sites listed in or eligible for listing in the National Register of Historic Places (historic properties as defined in Section 106 of the National Historic Preservation Act) within the area of potential effect. The State Historic Preservation Officer decided not to comment on our report, thus completing the Section 106 consultation process.

None of the sites eligible to the National Register of Historic Places will be affected in any of the action alternatives. All the sites are within protective buffers. There is a possibility, however, that undiscovered sites are present within some of the areas slated for timber harvest or road construction. In general, those alternatives that propose higher levels of ground disturbance pose a greater potential threat to significant undiscovered cultural resources.

#### Cumulative Effects

Impacts from decay, neglect, natural landscape changes and development pose a threat to the preservation of significant study area cultural resources. Future timber harvest and other ground disturbing development could result in the loss of cultural resources. Site looting and vandalism could occur due to increased access to remote areas. Previous cultural resource surveys indicate most if not all of the cultural resources are located within a short distance of the present coastline. It is impossible, however, to determine the exact number and nature of cultural resources that are threatened by future development. Maintenance of beach fringe and estuary buffer zones for future development will effectively lessen the potential impact to cultural resources. Implementation of field surveys and various mitigation measures will reduce the potential loss by preserving significant sites and by providing data on those that can not be preserved. Periodic monitoring of roads and timber harvest areas may reveal if previously undiscovered sites have been exposed or damaged. Monitoring may also be utilized to determine if sites outside direct impact areas are being affected by increased pedestrian traffic.

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#### Sensitive Plants

A sensitive plant survey was conducted to assess the effect on sensitive plant species if an action alternative is implemented. The LTF site and other beach areas were surveyed by the Alaska Natural Heritage botanist. Roads and harvest units were surveyed by District personnel while doing reconnaissance work. A total of 18 days were spent surveying the project area. The biological evaluation is on file at the District office.

Choris bog orchid (*Platanthera chorisiana*, ldk), a sensitive plant species, was found in the project area in four locations in the upper King George valley. Individual plants will be destroyed if roads are constructed as laid out in Alternatives 2,3, and 5 in the upper King George valley. The destruction of individual plants is not likely to affect overall species population viability because of the number of occurrences that have been reported on the Wrangell Ranger District. Additionally, not all plants that were discovered will be directly impacted by construction of the road or timber harvest units. However, viability of the population in upper King George is of concern. The plants subjected to indirect impacts related to this project will be monitored, and actions will be taken to protect them (see Appendix C).

*One sensitive plant was located by field surveys. Alternatives 2, 3, and 5 will affect individual plants, but not overall population viability.*

#### Timber and Soil Productivity

There are other natural processes taking place within King George study area that will have an affect on productivity and will need to be taken into account when management activities are implemented. Spacing and stand diversity work together to reduce insect population growth. Diverse landscapes, both vertical structure and plant species, will help prevent localized outbreaks from reaching epidemic levels. Insect populations decrease with increased distance to host trees which results in longer exposure to mortality agents and the elimination of energy reserves. There are two known outbreak locations of black-headed budworm in the King George study area. The budworm will be monitored to prevent further spread. If large numbers of trees start to die, actions may be taken to remove dead and weakened trees needed to prevent an epidemic.

Porcupines kill and cause wounds that introduce rot in western hemlock within the King George study area. Steps could be taken to increase the natural predators of porcupines, such as introduction of fishers, to reduce damage to the next rotation of western hemlock.

Yellow-cedar decline is not believed to be caused by biotic processes, for that reason the spread of the decline to healthy yellow-cedars is not believed to be a concern. Since yellow-cedar snags are very decay resistant they are not as valuable use for cavity nesting wildlife as other tree species. Yellow-cedar decline areas should be harvested for the wood quality that remains and replaced with a new health stand. Yellow-cedar decline areas will eventually regenerate, probably to western hemlock, but unless the snags are removed the trees growing among the snags will rub against them as the wind blows, this will cause rub scars on the hemlock which will be an entrance for insects and disease.

Building roads will permanently take some land out of production. If length and width of temporary spur roads are kept to a minimum, this will reduce the amount of land temporarily taken out of production. Clearing widths should be kept to a minimum along the mainline road paralleling King George and Honeymoon Creeks to reduce the likelihood of blowdown. Roads that are not maintained will return back into production but will be delayed 40-80 years because red alder usually dominates the site for this length of time before conifer re-establishment begins. Logging slash and cull logs left around landings in large quantities delay conifer establishment for a number of decades

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because there is not any soil or organic matter available for seedling establishment. Heavily used yarding corridors that degrade soil productivity can delay conifer establishment for 40-80 years because red alder will usually establish first on these sites.

*The 50% retention prescriptions will need to be carefully implemented to avoid reduction of timber productivity.*

The harvest prescriptions try to achieve multiple objectives, such as, scenic quality, reduce fragmentation, maintain stand structure, and harvest timber. All the prescriptions are believed to produce productive timber stands for future harvests. However, careful implementation will be needed to carry out the 50% retention prescriptions because if all the high quality trees are removed this entry, the timber productivity may be reduced. Timber production decline can be expected if the dominant trees left are cull and suppress the establishment and growth of new healthy seedlings and saplings. This problem can be avoided by leaving a mix of healthy tree species. This prescription will produce a 2 or 3 storied stand depending on how it is harvested the next entry.

The units treated with a 70% retention will retain their present timber productivity. This prescription will remove timber in small patches and groups. These areas will regenerate to western hemlock, which is the predominate species harvested. If patch and group size are large enough and an adequate seed source is available, then some Sitka spruce, Alaska yellow-cedar and redcedar can be expected to regenerate as well. Leaving a few healthy spruce and cedar as seedtrees will help to regenerate a mix of tree species within the patches and groups. This prescription will produce a uneven-aged stand that will need to be entered on a 20-50 year cutting cycle to harvest other patches and groups and precommercially thin the patches and groups that are harvested this entry. Trees heavily infected with mistletoe should not be left on the boundary of harvest patches or groups so that the productivity of the regeneration within the groups and patches will not be adversely affected.

Units that have a harvest prescription of 30% retention will result in a two storied stand. The retention is expected to contain some healthy codominant and intermediate yellow-cedar, spruce and redcedar, some dominate hemlock and spruce that are cull for cavity nesting wildlife, groups of healthy advanced regeneration that will be less than 10" DBH and snags, as safety permits. A good mix of tree species is expected to regenerate within these units. The stand is expected to be productive and the growth of the trees is expected to be greater than the spread of mistletoe, if present.

Areas that have a 10% retention prescription will produce a productive timber stand. When a seed source is available it produces the most tree diversity. The 10% retention prescription will remove a majority of the merchantable trees within the harvest unit. This prescription is the most effective way to control mistletoe and other diseases.

The overstory removal with 10% retention prescription will be used to remove yellow-cedar from cedar decline areas. The 10% retention will be the advanced regeneration, which is predominately hemlock saplings. It is important to remove the dead cedar before the hemlock gets larger and rub wounds become a problem. This prescription will produce an even-aged stand.

Common to all prescriptions for maintaining a healthy timber stand and to continue to meet multiple resource objectives, it will be critical to implement outyear treatments such as thinning and sanitation harvests.

*All alternatives protect long term soil and vegetation productivity.*

All alternatives were designed to protect the long term productivity of the study area through avoidance, protection using BMP's and site-specific mitigation measures. Site productivity was a primary consideration in designing harvest units. All units are located on ground capable of sustaining productivity with intensive forest management, including

### **3 - Affected Environment and Environmental Effects**

those areas identified as wetlands. A site specific erosion control plan will be developed for road construction, rock pit quarry development and the LTF.

#### **Native species**

Grass seeding is a standard practice for controlling soil erosion when the soil is exposed during construction. Typically, non-native species are used, resulting in the "introduction" of exotic species. In general, this has not been seen as a problem because the introduced grass species have not been found to invade and displace the native flora. To prevent the introduction of non-native flora into the King George timber sale area, native species will be used for erosion control and other revegetation purposes.

#### **Wild and Scenic Rivers**

The Tongass Land Management Plan Draft Revision of 1991 does not recognize any of the rivers within the study area as potentially eligible for designation as a Wild and Scenic River. We are aware that there is a citizens' proposal, backed by the Southeast Alaska Conservation Council (SEACC) and Tongass Rivers Coalition, to designate 5 miles of the King George River (in this document, we refer to it as King George 'Creek') as 'Wild' under the Wild and Scenic Rivers Act. Wild Rivers have a quarter mile protection buffer on each side of the river. Alternatives 2, 3, and 5 propose harvest units within a quarter mile of King George Creek. Alternatives 1, 4, and 6 do not propose harvest within a quarter mile of King George Creek.

#### **Other Findings**

The effects of the alternatives on consumers is reflected in the discussion of the various goods and services supplied as a result of the proposed alternatives (see Issue #2, this chapter). We have determined that the actions proposed in the alternatives will not adversely affect prime farm land, range land, rivers eligible for Wild and Scenic River designation, Class II Airshed standards associated with the Clean Air Act, or Wilderness, nor will it adversely impact civil rights, women, or minorities.



# Chapter 4

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# Chapter 4

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# Chapter 6

## Glossary

# Chapter 6

## Glossary

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## Acronyms Used in Text

ACMP	Alaska Coastal Management Program
ADF&G	Alaska Department of Fish and Game
AHMU	Aquatic Habitat Management Unit
ANSCA	Alaska Native Settlement Act of 1971
ANILCA	Alaska National Interest Lands Conservation Act of 1980
BMP	Best Management Practices
CFR	Code of Federal Regulations
CMP	Corrugated Metal Pipe
CMPA	Corrugated Metal Pipe Arch
CZMA	Coastal Zone Management Act of 1976
DEIS	Draft Environmental Impact Statement
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
EVC	Existing/Expected Visual Condition
FEIS	Final Environmental Impact Statement
FSH	Forest Service Handbook
FSM	Forest Service Manual
GIS	Geographic Information System
GMU	Game Management Unit
HSI	Habitat Suitability Index
IDT	Interdisciplinary Team
KV	Knutsen-Vandenburg Act
LTF	Log Transfer Facility
LUD	Land Use Designation
LWD	Large Woody Debris
MBF	One Thousand Board Feet
MIS	Management Indicator Species
MMBF	Million Board Feet
NEPA	National Environmental Policy Act of 1969
NFMA	National Forest Management Act
ROD	Record of Decision
ROS	Recreation Opportunity Spectrum
RVD	Recreation Visitor Day
SEIS	Supplemental Environmental Impact Statement
SHPO	State Historic Preservation Officer
TIMCLU	Timber - Common Land Unit, GIS Layer
TLMP	Tongass Land Management Plan
TM	Thematic Mapping
TRUCS	Tongass Resource Use Cooperative Survey
TTRA	Tongass Timber Reform Act
USDA	United States Department of Agriculture
VCU	Value Comparison Unit
VQO	Visual Quality Objective
WAA	Wildlife Analysis Area

### Terms Used in Text

**Alaska National Interest Lands Conservation Act (ANILCA)**

Passed by Congress in 1980, this legislation designated 14 National Forest Wilderness areas in Southeast Alaska. In section 705(a), Congress directed that at least \$40,000,000 be made available annually to the Tongass Timber Supply Fund to maintain the timber supply from the Tongass National Forest at a rate of 4.5 billion board feet per decade. Section 810 requires evaluation of subsistence impacts before changing the use of these lands.

**Alaska Native Claims Settlement Act (ANSCA)**

ANSCA, which became law on December 18, 1971, provides for the settlement of certain land claims of Alaska natives and for other purposes.

**Alpine/Subalpine Habitat**

The region found on mountain peaks above conifer stands.

**Beach Fringe Habitat**

Habitat that occurs from the intertidal zone inland 500 feet, and islands of less than 50 acres. This habitat is especially important to marine and upland species.

**Benthic Habitat**

Refers to the substrate and organisms on the bottom of marine environments.

**Best Management Practices (BMP)**

Land management methods, measures, or practices intended to minimize or reduce water pollution. Usually BMPs are applied as a system of practices rather than a single practice. BMPs are selected on the basis of site-specific conditions that reflect natural background conditions and political, social, economic, and technical feasibility.

**Biodiversity**

Variety of life and its processes.

**Bole**

The trunk or main stem of a tree.

**Buffer**

Tongass Timber Reform Act requires that timber harvest be prohibited in an area no less than 100 feet of uncut timber in width from each side of all Class I streams and Class II streams which flow directly into Class I streams. This 100 foot area is referred to as a buffer.

**Clearcut Regeneration Method**

The objective of this regeneration method is to provide site conditions favorable for the establishment, growth, and management of desired species. Cool growing conditions, wet soils, strong winds, shallow rooted trees, abundant natural regeneration, and economic factors in southeast Alaska make this regeneration method the most desirable on most areas for stand establishment and management.

**Commercial Fishery**

Fish, shellfish, or other fishery resources taken or processed within a designated area for commercial purposes.

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### **Commercial Forest Land**

Productive forest land that is producing, or capable of producing, crops of industrial wood and is not withdrawn from timber utilization by statute or administrative regulation. This includes areas suitable for management and generally capable of producing in excess of 20 cubic feet per acre of annual growth, or in excess of 8,000 board feet net volume per acre. It includes accessible and inaccessible areas.

*Standard CFL:* Timber that can be economically harvested with locally available logging systems such as highlead or short span skyline.

*Nonstandard CFL:* Timber that cannot be harvested with locally available logging systems and would require the use of other logging systems such as helicopter or longspan skyline.

### **Cruise**

Refers to the general activity of determining timber volume and quality.

### **Cultural Resources**

Historic or prehistoric objects, sites, buildings, structures, and so on, that result from past human activities.

### **Cumulative Effects**

Cumulative effects are the impacts on the environment resulting from the addition of the incremental impacts of past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such action. Cumulative impacts can result from individually minor but collectively significant actions occurring over time.

### **Deer Winter Range**

A combination of environmental elements that support Sitka black-tailed deer under moderately severe or severe winter conditions. Usually associated with high volume old-growth stands at low elevation and south aspects.

### **Draft Environmental Impact Statement (DEIS)**

A statement of environmental effects for a major Federal action released to the public and other agencies from comment and review prior to a final management decision. (Required by Section 102 of the National Environmental Policy Act.)

### **Estuarine Fringe Habitat**

This habitat type is located within a 1,000 foot zone around an estuary. It is especially important for shorebirds, waterfowl, bald eagles, and other marine associated species.

### **Estuary**

For the purpose of this EIS, estuary refers to the relative flat, intertidal, and upland areas generally found at the heads of bays and mouths of streams. They are predominately mud and grass flats and are unforested except for scattered spruce or cottonwood.

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### **Even-Aged Stand Management**

A stand management strategy usually results in trees of one or two age classes within the stand. There are usually one or two entries which create site conditions favorable for seedling establishment. The three even-aged regeneration methods are seed tree, shelterwood, and clearcut. Stand regulation is simply managed by using one rotation age for a stand. The associated management costs are greatly reduced because of fewer harvest entries and stand treatments. Biological diversity is generally measured within the larger landscape or forest rather than within the even-aged stand.

### **Fish Habitat**

The aquatic environment and the immediately surrounding terrestrial environment that, combined, afford the necessary physical, biological support systems required by fish species during the various life stages.

### **Fish Habitat Capability**

The carrying capacity or the maximum number of fish the habitat can produce. Habitat capability is measured in smolts for anadromous fish and in numbers of adult fish for resident species.

### **Floodplain**

The lowland and relatively flat areas joining inland and coastal waters, including debris cones and flood-prone areas of offshore islands; including, at a minimum, that area subject to a 1 percent (100 year recurrence) or greater chance of flooding in any given year.

### **Forested Habitat**

All areas with forest cover. Used in this EIS to represent a general habitat zone.

### **Group Selection Regeneration Method**

Small groups of trees are removed to create new groups of uniform, balanced age classes within the stand. The openings are usually regenerated from seed of the surrounding trees. Age class regulation within groups is usually accomplished by removing unwanted trees when adjacent groups are harvested.

### **Habitat Capability**

The number of healthy animals that a habitat can sustain.

### **Highlead Cable Logging**

A method of transporting logs to a collecting point (landing) by using a power cable passing through a block fastened off the ground to lift the front ends of the logs clear off the ground while in transit.

### **Habitat Suitability Index**

This is a value assigned to a unit of land using a computerized model that relates vegetative and geographic characteristic (e.g. stand volume, proximity to a stream or cliff, slope, aspect, etc.) to the land unit's value for a particular wildlife species. Values range from 0 to 1, with 1 being the best. The Habitat Capability Models used to generate HSIs were developed by interagency teams of biologists using the best available information including research results and best professional judgment.

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### **Important Subsistence Use Area**

Important Subsistence Use Areas include the “most-reliable” and “most often hunted” categories from the TRUCS survey and from subsistence survey data from ADF&G, the University of Alaska, and the Forest Service, Region 10. Important use areas include both intensive and extensive use areas for subsistence harvest of deer, furbearers, and salmon.

### **Individual Tree Selection Regeneration Method**

Single trees are removed throughout the stand, and new trees are established soon after each harvest occurs. Regeneration is normally from seed of the surrounding trees. Age class distribution of a stand is regulated by frequent harvesting which removes trees from all age classes during each entry.

### **Interdisciplinary Team**

Two or more natural resource planners who use relevant information to develop alternative design and comparison for a proposed project. The team insures that integrated use of environmental, social, and economic information is clearly presented so the best decision can be made.

### **Intermediate Stand Treatments**

A stand management treatment which manipulates stand growth, composition, structure, or tree quality. Intermediate treatments include thinning, pruning, clearing, weeding, liberation, release, improvement, salvage, and sanitation cutting to achieve different management objectives. These stand treatments do not attempt to obtain new tree regeneration, and they occur before the final regeneration harvest. Some treatments such as salvage cutting or commercial thinning result in the harvest of forest products.

### **Land Use Designation**

The method of classifying land uses presented in the Tongass Land Management Plan (TLMP). Land uses and activities are grouped to define, along with a set of coordinating policies, a compatible combination of management activities. The following is a description of the four classifications:

*LUD I:* Wilderness areas.

*LUD II:* These lands are to be managed in a roadless state in order to retain their wildland character, but this designation would permit wildlife and fish habitat improvements, as well as primitive recreation facilities, and road development under special authorization.

*LUD III:* These lands may be managed for a variety of uses. The emphasis is on managing for uses and activities in a compatible and complimentary manner to provide the greatest combination of benefits.

*LUD IV:* These lands provide opportunities for intensive resource use and development, where the emphasis is primarily on commodity or market resources.

### **Large Woody Debris (LWD)**

Any piece of relatively stable woody material having a small-end diameter of at least 10 centimeters (4 inches) and a length greater than one meter (3 feet) that intrudes into the stream channel.

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### **Log Transfer Facility**

A facility that is used for transferring commercially harvested logs to and from a vessel or log raft. It is wholly or partially constructed in waters of the United States and location and construction are regulated by the 1987 Amendments to the Clean Water Act. Formerly termed "terminal transfer facility."

### **Logging Camp**

A temporary facility established to house industry and Forest Service personnel while timber harvest occurs in the area.

### **Mass Failure**

The downslope movement of a block or mass of soil. This usually occurs under conditions of high soil moisture, and does not include individual soil particles displaced as surface erosion.

### **Mitigation**

Includes avoiding an impact altogether by not taking a certain action or part of an action; minimizing an impact by limiting the degree or magnitude of an action and its implementation; rectifying the impact by repairing, rehabilitating, or restoring the affected environment; reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; or compensating for the impact by replacing or providing substitute resources or environments.

### **Multiple Entry**

More than one stand or land treatment activity during a rotation of a stand or area.

### **National Environmental Policy Act of 1969**

An act declaring a National policy to encourage productive harmony between humans and their environment, to promote efforts which will prevent or eliminate damage to the environment and the biosphere and stimulate the health and welfare of humans, to enrich the understanding of the ecological systems and natural resources important to the Nation and to establish a Council on Environmental Quality.

### **National Forest Management Act**

A law passed in 1976 that amends the Forest and Rangeland Renewable Resources Planning Act and requires the preparation of Forest Plans.

### **"No Action" Alternative**

The most likely condition expected to exist in the future if current management direction would continue unchanged.

### **Old-Growth**

Ecosystems distinguished by old trees and related structural attributes.

### **Old-Growth Habitat**

Wildlife habitat managed to maintain old-growth forest characteristics through the planning period.

### **Overstory Removal**

Removing the overstory or dominant trees from the forest while leaving smaller understory trees.

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### **Precommercial Thinning**

An intermediate stand treatment in even-aged stands which removes immature or undesirable trees to reduce competition so remaining trees can more fully utilize site potential and remain in a healthy condition.

### **Proportionality**

The Tongass Timber Reform Act of 1990 states: "eliminate the practice of harvesting a disproportionate amount of old-growth timber by limiting the volume harvested over the rotation in volume classes 6 and 7, as defined in TLMP and supporting documents, so that the proportion of volume harvested in these classes within a contiguous management area does not exceed the proportion of volume currently represented by these classes within the management area."

### **Recreation Opportunity Spectrum (ROS)**

A system for planning and managing recreation resources that categorized recreation opportunities into the following seven classes:

*Primitive 1:* A natural environment of fairly large size. Interaction between users is minimal. The area is managed to be essentially free from evidence of human-induced restrictions and controls.

*Primitive 2:* A natural environment of fairly large size adjacent to saltwater. Interaction between users is very low, and evidence of other users is minimal. The area is managed to be essentially free from evidence of human-induced restrictions and controls. Motorized use may occur at infrequent levels.

*Semi-Primitive Non-Motorized:* A natural or natural-appearing environment of moderate to large size. Concentration of users is low, but there is often evidence of other users. The area is managed to minimize on-site controls and restrictions. Use of local roads for recreational purposes is not allowed.

*Semi-Primitive Motorized:* A natural or natural-appearing environment of moderate to large size. Concentration of users is low, but there is often evidence of other users. The area is managed to minimize on-site controls and restrictions. Local roads used for other resource management activities may be present.

*Roaded Natural:* A natural-appearing environment with moderate evidence of the sights and sounds of man. Such evidence usually harmonizes with the natural environment. Interaction between users may be moderate to high with evidence of other users prevalent. Motorized use is allowed.

*Roaded Modified:* A natural environment that has been substantially modified particularly by vegetative manipulation. There is strong evidence of roads and/or highways. Frequency of contact is low to moderate

*Rural:* A natural environment that has been substantially modified by development of structures and vegetative manipulation. Structures are readily apparent and may range from scattered to small dominant clusters. Sights and sounds of humans are readily evident, and the interaction between users is often moderate to high.

## 6 - Glossary

### **Recreation Places**

Identified geographical areas having one or more physical characteristics that are particularly attractive to people engaged in recreation activities. For example, they may be beaches, streamside or roadside areas, trail corridors, hunting areas of the immediate area surrounding a lake, cabin sites, or campgrounds.

### **Redd**

Nest made in gravel, consisting of a depression hydraulically dug by a fish for egg deposition and then refilled with gravel.

### **Retention Factor**

The amount of commercial forest land removed from the timber base to protect other resource values. These factors are allowances available to draw upon when meeting other resource needs and are not fixed policies to be rigidly applied by the IDT or Forest Supervisors.

### **Rotation**

The planned number of years (approximately 100 years in Alaska) between the time that a forest stand is regenerated and its final cutting at a specified stage of maturity.

### **Salvage Cutting**

Cutting primarily to utilize dead/down material resulting from windthrow and scattered poor risk trees that will not be marketable if left in the stand until the next scheduled harvest. Salvage sales must contain more than 50 percent by volume of dead, insect infested, or windthrown timber.

### **Sawlog**

A log considered suitable in size and quality for producing sawn timber.

### **Section C Timber Sale Contract**

Written contract requirements and conditions that purchaser must adhere to during a timber sale.

### **Seed Tree Regeneration Method**

The objective of this regeneration method is to only leave trees which will provide seed to establish the new stand. Seed trees usually have good form, produce seed, are of the desired species, and are spaced to ensure adequate seed distribution. After the new seedlings are established, the seed trees are harvested, unless they are prescribed to be left as retention.

### **Silviculture**

The branch of forestry involving the theory and practice of manipulating the establishment, composition, structure, and growth of forest vegetation. Silviculture involves the appropriate application of ecological, social, and economic principles of vegetative management to achieve resource management objectives and desired future forest conditions.

### **Silvicultural Prescription**

A written technical document which provides detailed implementation direction about methods, techniques, timing, and monitoring of vegetative treatments. A prescription is prepared after a preferred treatment alternative has been selected, but before the project is implemented. A prescription is prepared by a silviculturalist who uses interdisciplinary input to best achieve established objectives, direction, and requirements for land managed by the USDA Forest Service.

## 6- Glossary

### **Slash**

Debris left over after a logging operation; i.e. limbs, bark, broken pieces of logs.

### **Soil Hazard Index**

A relative index assigned to each soil map unit within which various soil hazards may be encountered. Hazards include mass failures and high sediment production during road construction.

### **Spawning Area**

The available area in a stream course which is suitable for the deposition and incubation of salmon or trout eggs.

### **Species Diversity**

The number of different species occurring in a location or under a similar environmental condition.

### **Stream Classification System**

A means to categorize stream channels based on their fish production values. There are four stream classes on the Tongass National Forest. They are:

*Class I:* Streams with anadromous (fish ascending from oceans to breed in freshwater) or adfluvial (fish ascending from freshwater lakes to breed in streams) lake and stream fish habitat. Also included is the habitat upstream from migration barriers known to be reasonable enhancement opportunities for anadromous fish and habitat with high value resident sport fish populations.

*Class II:* Streams with resident fish populations and generally steep (often 6-15 percent) gradient (can also include streams from 0-6 percent gradient where no anadromous fish occur). These populations have limited sport fisheries values. These streams generally occur upstream of migration barriers or are steep gradient streams with other habitat features that preclude anadromous fish use.

*Class III:* Perennial and intermittent streams with no fish populations, but which have sufficient flow or transport sufficient sediment and debris to have potential water quality influence on downstream water quality or fish habitat capability. These streams generally have bankfull widths greater than 5 feet and are highly incised into the surrounding hillslope.

*Class IV:* Other intermittent, ephemeral, and small perennial channels with insufficient flow or sediment transport capabilities to have an immediate influence on downstream water quality or fish habitat capability. These streams generally are shallowly incised into the surrounding hillslope.

*Non-streams* are rills and other watercourses, generally intermittent and less than 1 foot in bankfull width, little or no incisement into the surrounding hillslope, and with little or no evidence of scour.

### **Subsistence**

The term "subsistence uses" means the customary and traditional uses by rural Alaska residents of wild renewable resources for direct, personal, or family consumption as food, shelter, fuel, clothing, tools, or transportation; for the making and selling of handicraft articles out of non-edible byproducts of fish and wildlife resources taken for personal or family consumption; and for customary trade.

## 6 - Glossary

### **Succession**

Changes over time in plant and animal populations or communities. Young, developing populations or communities usually change over time into perpetuating populations if environmental conditions do not change.

### **Suitability**

An evaluation based upon a resource's potential use within proposed management activities.

### **Thematic Mapping**

A vegetation map based on satellite imagery.

### **Thousand Board Foot Measure**

A method of timber measurement in which the unit is equivalent to 1,000 square feet of lumber one inch thick. It can be abbreviated Mbd, Mbm, or MBF.

### **TIMCLU**

A map of forest management attributes based on soil units.

### **Tongass Land Management Plan (TLMP)**

The land allocation plan for the Tongass National Forest which serves to direct and coordinate further planning on the Forest as well as the uses carried on within the Forest on a day-to-day basis. TLMP provides management direction for a period of ten years.

### **Tongass Resource Use Cooperative Study (TRUCS)**

A compilation of subsistence data for evaluating the effects of the Forest Service's action contemplated in the revision of the regional Tongass Land Management Plan.

### **Uneven-aged Stand Management**

A forest stand management strategy which results in trees of at least 3 three age classes. Relatively frequent harvest entries remove mature and immature trees either singly (individual tree selection) or in groups (group selection). Natural regeneration usually occurs soon after each harvest entry. Intermediate stand treatments are usually performed when the harvest entry occurs. Stand regulation or management is accomplished by manipulating stand density, stand structure, species composition, re-entry periods, and maximum tree age. These manipulation variables significantly increase the complexity of intensive forest management for uneven-aged stands. Biological diversity is generally greater within an uneven-aged stand than within an even-aged stand.

### **V-Notch**

A relatively narrow, steep, V-shaped stream channel generally on steep, mountainous terrain.

### **Value Comparison Unit (VCU)**

A distinct geographic area that generally encompasses a drainage basin containing one or more large stream systems. Boundaries usually follow easily recognizable watershed divides. These units were established on the Tongass National Forest to provide a common set of areas for which resource inventories could be conducted and resource value interpretations made.

## 6- Glossary

### **Visual Quality Objective (VQO)**

A desired level of scenic quality and diversity of natural features based on physical and sociological characteristics of an area. Refers to the degree of acceptable alterations of the characteristic landscape.

*Inventory VQO:* Derived through application of the USDA Visual Management System. Uses three elements to determine the inventory: Sensitivity levels, distance zones, and landscape variety class. Provides a benchmark and illustrates the optimum objective based on current use patterns and sensitivity.

*Adopted VQO:* The VQO to be achieved as a result of management direction identified in the approved forest plan. Adopted VQOs represent the visual resource objective for the Forest Land Management Plan period, normally 10 years (FSH 2309.22, R10 Landscape Management Handbook).

*Preservation:* Management activities are generally not allowed in this setting. The landscape is allowed to evolve naturally.

*Retention:* Management activities are not evident to the casual forest visitor.

*Partial Retention:* Management activities may be evident, but are subordinate to the characteristic landscape.

*Modification:* Management activities may dominate the characteristic landscape but will, at the same time, use naturally established form, line, color, and texture. It should appear as a natural occurrence when viewed as middleground (1/4 to 5 miles from viewer).

*Maximum Modification:* Management activities may dominate the characteristic landscape, but should appear as a natural occurrence when viewed as background.

### **Volume**

Stand volume based on standing net board feet per acre by Scribner Rule.

### **Volume Class**

Average timber stand volume, given as thousand board feet per acre. The volume classes used in this EIS are 8-20, 20-30, 30-50, and 50+ MBF/acre.

### **Weighted Mean Patch Size**

A measure of the average size of blocks of forest used in areas with non-normal distribution of patch sizes. Calculated as the sum of all (patch size/total forest area) multiplied by patch size.

### **Wetland**

Those areas that are inundated by surface or ground water frequently enough to support vegetation or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction.

### **Wildlife Habitat**

The locality where the species may be found and where all essentials for its development and existence are present.

## 6 - Glossary

### **Wildlife Habitat Management Unit (WHMU)**

An area of wildlife habitat identified during the IDT process as having wildlife values of such importance that the habitat within the management area designated by the IDT is managed with wildlife as the primary resource value.

### **Windsnap**

Occurs when wind is used as the mechanism that breaks the bole of the tree, usually at a weak point caused by bole rot or some other process that weakened the wood fibers within the tree. The root wad is still anchored into the ground.

### **Windthrow (Blowdown)**

Trees which the wind blows over and the root wad is still attached to the tree bole.

Windthrown trees usually displace soil because the tree roots have been ripped out of the ground.

# Chapter 7

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# **Appendix A**

## **Summary of Landscape Analysis and Desired Future Condition**

# Appendix A

Summary of Landscape  
Analysis and District  
Future Condition

# Appendix A

## Summary of Landscape Analysis and Desired Future Condition

### Summary of Etolin Landscape Analysis

The King George interdisciplinary team began by examining the importance of the King George study area within the landscape. Our primary interest was to determine how harvest in the study area might affect key wildlife corridors and large contiguous blocks of old growth. We also took into account the possibility of future harvest of other areas on Etolin Island. The following are our key findings:

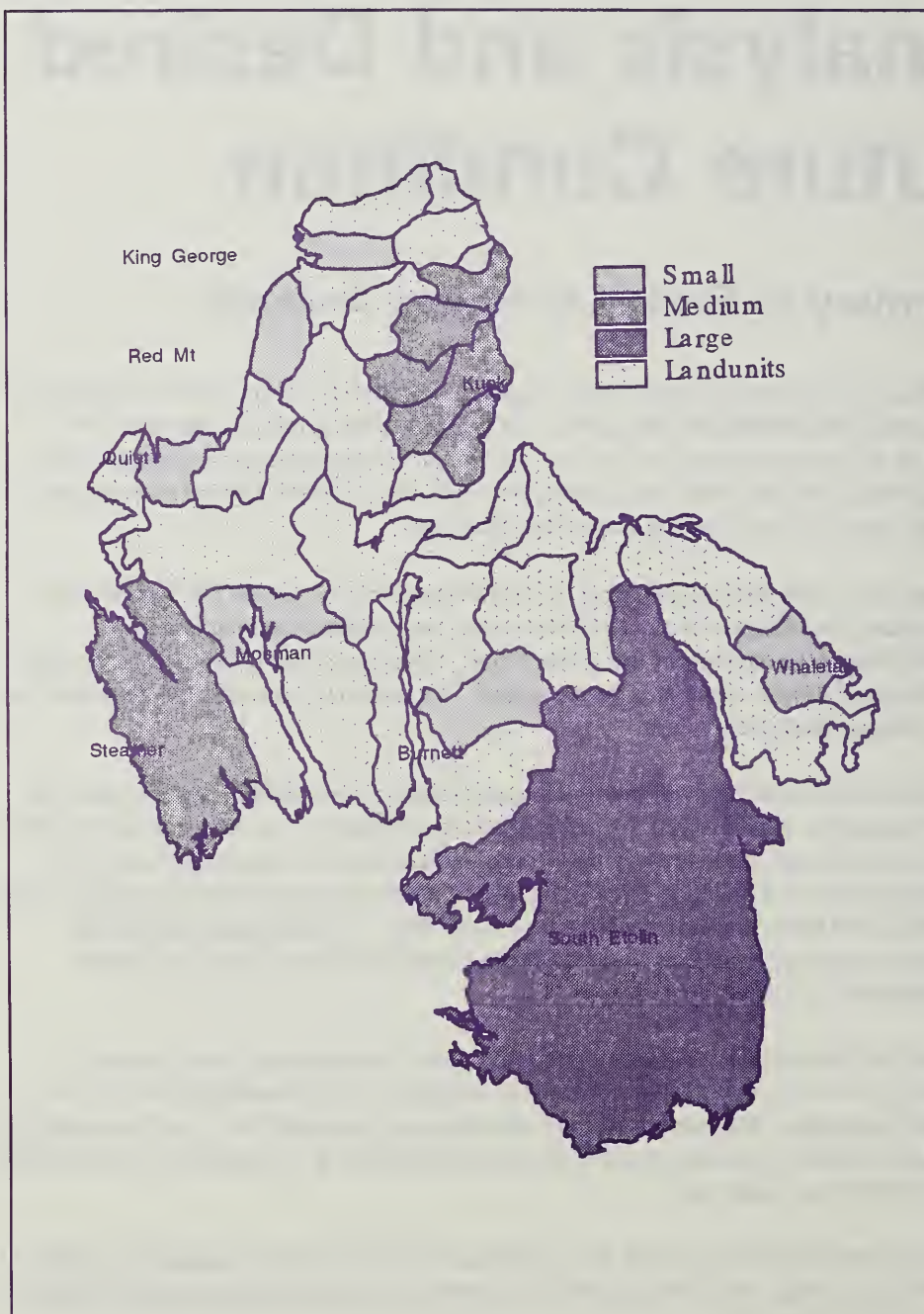
- ◆ The Kunk Lake and Steamer Bay Value Comparison Units make the best potential medium size old growth blocks because they have valuable habitat and best compliment the location of the South Etolin Wilderness which functions as the large old growth conservation area on the island. These areas also have high dispersed and developed recreation values.
- ◆ Several smaller old growth blocks or conservation areas would be most effective in allowing dispersal between the medium and large blocks. Two of these are located in the King George study area (King George Estuary and Red Mountain Face). We made the recommendation to defer harvest in these two areas because a suitable small old growth block was not available near Anita Bay. The landscape is naturally fragmented near Anita Bay and past harvest (Starfish Timber Sale) has further fragmented old growth.
- ◆ The Red Mountain area makes a good old growth conservation block because it likely provides a dispersal corridor in the landscape. The forest habitat to the east of Red Mountain is fragmented by high elevation and open habitats. Red Mountain is in a key location to provide possible dispersal for species on the north half of the island to move to the south half.
- ◆ The lower King George creek area is the best old growth conservation block within the King George study area because it includes an estuary, has the greatest potential

## A - Landscape Analysis and DFC

to remain unroaded, has high wildlife values and contains the largest anadromous fishery. Locating a conservation block at King George also benefits cultural resource protection and recreation values.

- ◆ This network of large, medium and small old growth conservation areas would be effective when combined with TTRA buffers, beach buffers and inaccessible areas and other exclusions, in providing for an old growth network on the island over time. The cumulative effects of harvest are reduced by ensuring larger blocks of old growth are reserved across the landscape. Further impacts of harvest could be reduced by harvest methods that leave trees (wildlife legacies) within harvest units to varying degrees. Critical areas which have been harvested in the past should be managed to mimic stand re-initiation and/or old growth conditions over time.

**Figure A-1: Potential Old Growth Conservation Areas**



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### Potential Cumulative Effects on Etolin Island Vegetation

There were originally 119,540 acres of old growth on Etolin Island. Of this, 114,960 acres were interconnected by old growth stringers. Many of these stringers are too narrow to be used by interior old growth species, but would be used by other species such as deer, marten and red squirrels. There are currently 114,190 acres of old growth remaining on Etolin Island but only 104,380 acres are still interconnected. The rest of this block has been harvested or isolated by clearcuts. For species requiring interior old growth conditions, there were originally 9 blocks of interior old growth that were at least 1000 acres in size. Over the next ten years, further harvest is anticipated on Etolin Island that totals 80 MMBF. Possible cumulative effects of proposed harvest over the next ten years on Etolin Island are displayed in Table A-1 and Figures A-2, A-3 and A-4.

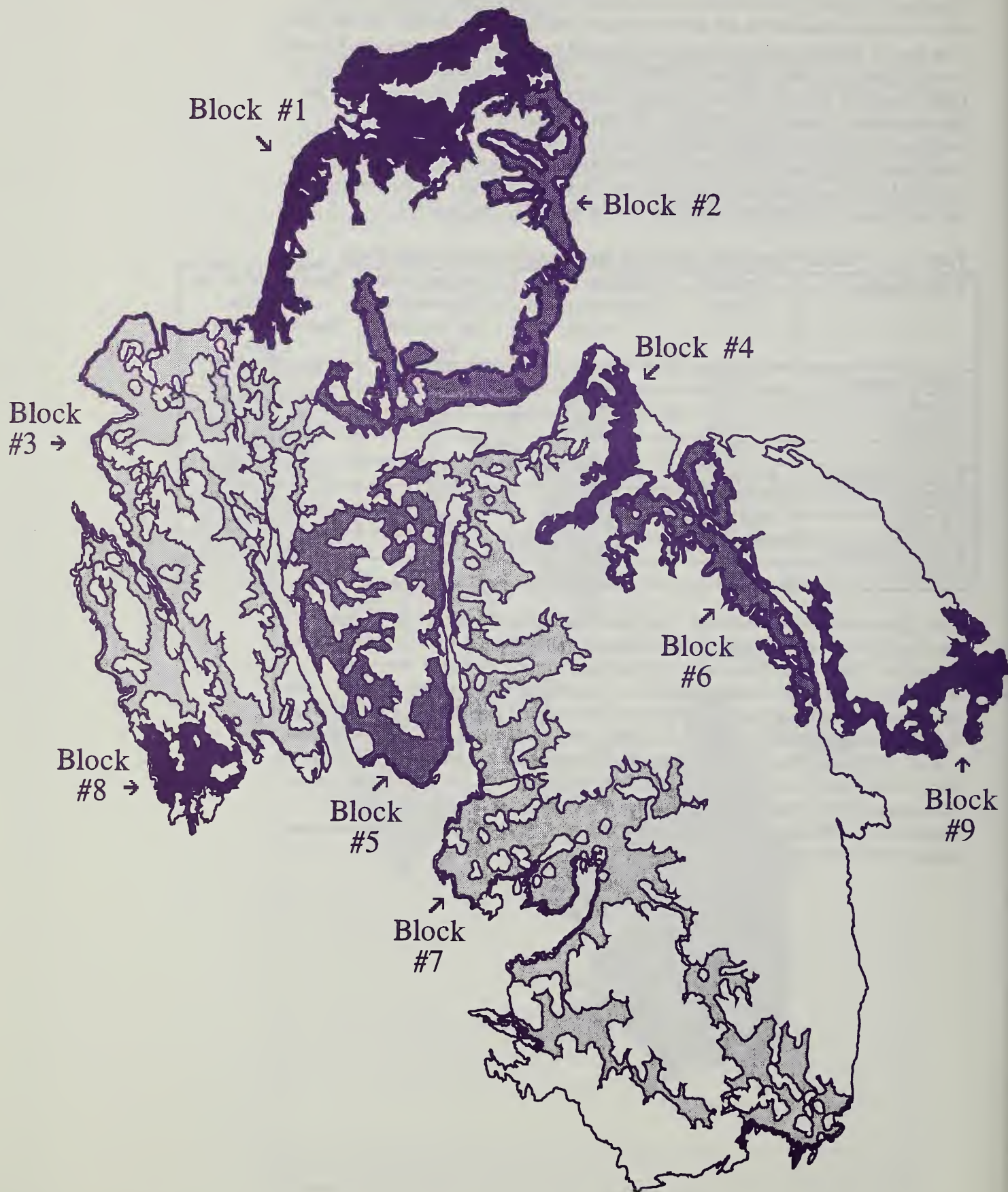
**Table A-1: Possible Cumulative Effects of Harvest Over the Next Ten Years**

Block Number	Original Acres	Existing Acres in Blocks >1000 Acres	Potential Acres of Harvest Over the Next 10 Years	Possible Effect on Block Size Assuming 'Worst Case'
1-King George	6,072	5,887	1,300 (Alt 5)	3,287 in 3 blocks
2-Kunk	5,756	4,654	0	4,654 (no change)
3-Steamer	14,490	11,015	780	9,455 in 1 block
4-SE Anita	1,251	0	0	0 (no change)
5-Mosman/Burnett	8,032	1,552 & 4,190	1,200	3,000 in 1 block
6-Menefee	2,718	2,395	130	2,135 in 1 block
7-S. Etolin	21,316	19,579	1,500	16,579 in 2 blocks
8-Three Way Pass	1,751	1,744	0	1,744 (no change)
9-SW Cove	3,298	2,195	390	0

*Note-* This analysis was conducted by assuming an average number of acres would be harvested in order to attain the volume scheduled with sales on the Stikine Area 10 year action plan. Since these future sales have not been planned, we had to make some assumptions about their location and effects. We assumed a "worst case scenario" where all acres harvested would be located entirely within the old growth blocks that are greater than 1000 acres in size (it is likely that future harvest could take place within old growth blocks <1000 acres, thus reducing effects on the larger blocks). We also assumed that the effects of this harvest would fragment twice the area as actually harvested. For example, if harvest units are spread out in a watershed it is possible for 50 acres of harvest to fragment 100 acres of an old growth block (once future harvest units are designed actual impacts will likely be less).

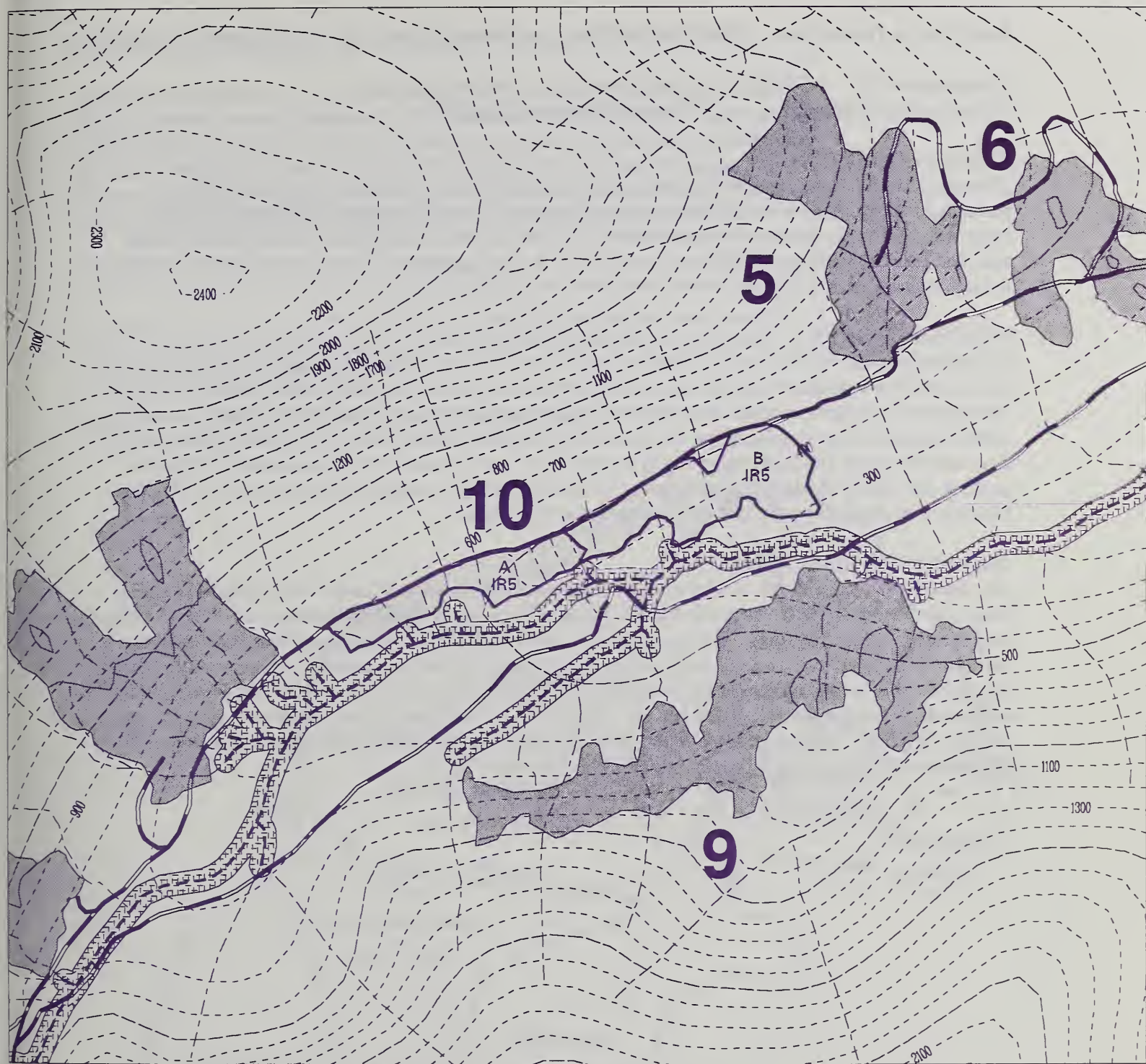
## A - Landscape Analysis and DFC

Figure A-2: Original Large Interior Old Growth Blocks




# UNIT 10


## Alternatives 3, 4 & 5



 Proposed Roads


 Class 1 Streams

 Class 2 Streams

 Class 3 Streams

★ Eagle Nest Tree

E Proposed Log Transfer Facility

 Proposed cut units

 Adjacent proposed units

 Saltwater and Lakes

 TTRA Buffers

Scale: 4 inches = 1 mile

A Section  
PR1 Prescription

King George Timber Sale      Unit Number 10      In Alternative 1

Compartment 156    VCU 462      Total Acres 16      Harvest Acres 16  
Harvest method helicopter      Volume Harvested 564 MBF

**EXISTING CONDITION:**

The unit is located in the Honeymoon land unit and is visible Zimovia highway. There is extensive porcupine activity and bole rot within the western hemlock. The unit is located within high deer winter range and high brown creeper and marten habitat. This unit is heavily populated by red squirrels, moose and elk. This unit is contained within a travel corridor for large mammals. There are two class III streams in the western portion of this unit which are tributary to class II streams.

**DESIRED CONDITION:**

The desired condition of this unit is to harvest timber over a 300 year rotation and meet partial retention. This unit will be managed to produce high quality Sitka spruce lumber and other timber products. Harvest will maintain a moderate amount of retention through the unit, which will reduce fragmentation. Maintain stilted root trees of any species, snags, trees with large branches (greater than 3") for nesting platforms and large diameter trees with heart rot for cavity nesting birds. Harvest activity will mimic natural vegetative patterns such as blowdown or disease pockets. Minimize sediment transport to downstream fish habitat. Maintain a large wood supply to stream channels over the rotation.

**PRESCRIPTION DIRECTION:**

The objectives of this unit can best be met by uneven-aged management. The unit will retain 50 % of the basal area. Retention should be as windfirm as possible, particularly adjacent to streams and stream buffers. Regeneration of harvested areas will be naturally seeded by adjacent trees and seed trees. If a adequate stocking is not achieved by natural regeneration, then Sitka spruce will be planted. Future stand treatments may involve limited thinning, pruning or sanitation to favor spruce and growth of trees with good form for timber. These treatments will also seek to maintain 10-15% of the trees as future snags and large trees for structural diversity. Place a standard 100' buffer along Honeymoon Creek and it's class II tributaries. Class III streams will be protected by streamcourse protection clause 'c'.

## Desired Conditions in the King George Study Area

After determining some key actions we could take in the study area to minimize our effects on habitat conservation issues across the landscape, we focused on determining the potential desired condition of the King George study area. Because the proposed timber sale is the first major harvest in the area, it is important to 'think ahead' so planning incorporates key environmental values while economically harvesting timber. From this study, we were able to refine the purpose and need for the proposed sale.

The process we followed is briefly described below:

We divided the study area up into smaller watersheds that had similar environmental issues (see Figure A-5 for land units). Each land unit was described in terms of its ecology, social and economic conditions.

Figure A-5: Land Units in the King George Study Area



## A - Landscape Analysis and DFC

We identified macro and micro disturbance factors naturally occurring in the study area in order to possibly 'mimic' them with our harvest practices. Disturbance factors include: porcupines, windthrow, cedar die-back and decline, beaver activity, landslides, avalanches and flooding. Blowdown occurs more frequently around the 'corners' of the study area near Chichagof pass. Most other blowdown is relatively small in scale. Landslides are a more prevalent disturbance feature and resulted in many of the forest characteristics we see today. We found that:

- ◆ The vegetative patterns of landslides and patchy blowdown could be copied,
- ◆ Management practices would have to be conscious of flooding events especially when designing roads,
- ◆ Porcupines would play a role in stand regeneration by chewing on young hemlock and,
- ◆ The cedar die-back and decline areas could be harvested with few environmental effects.

We identified key wildlife dispersal areas, unique areas and critical habitat. Key wildlife dispersal areas or corridors included; the Kunk Lake saddle, Fishtap Creek, elevational corridors on the south-facing slopes and riparian corridors. Unique areas or critical habitats included the estuaries, riparian areas, south facing slopes, a high volume stand on the north side of Honeymoon Creek and the beaver ponds at the head of King George Creek.

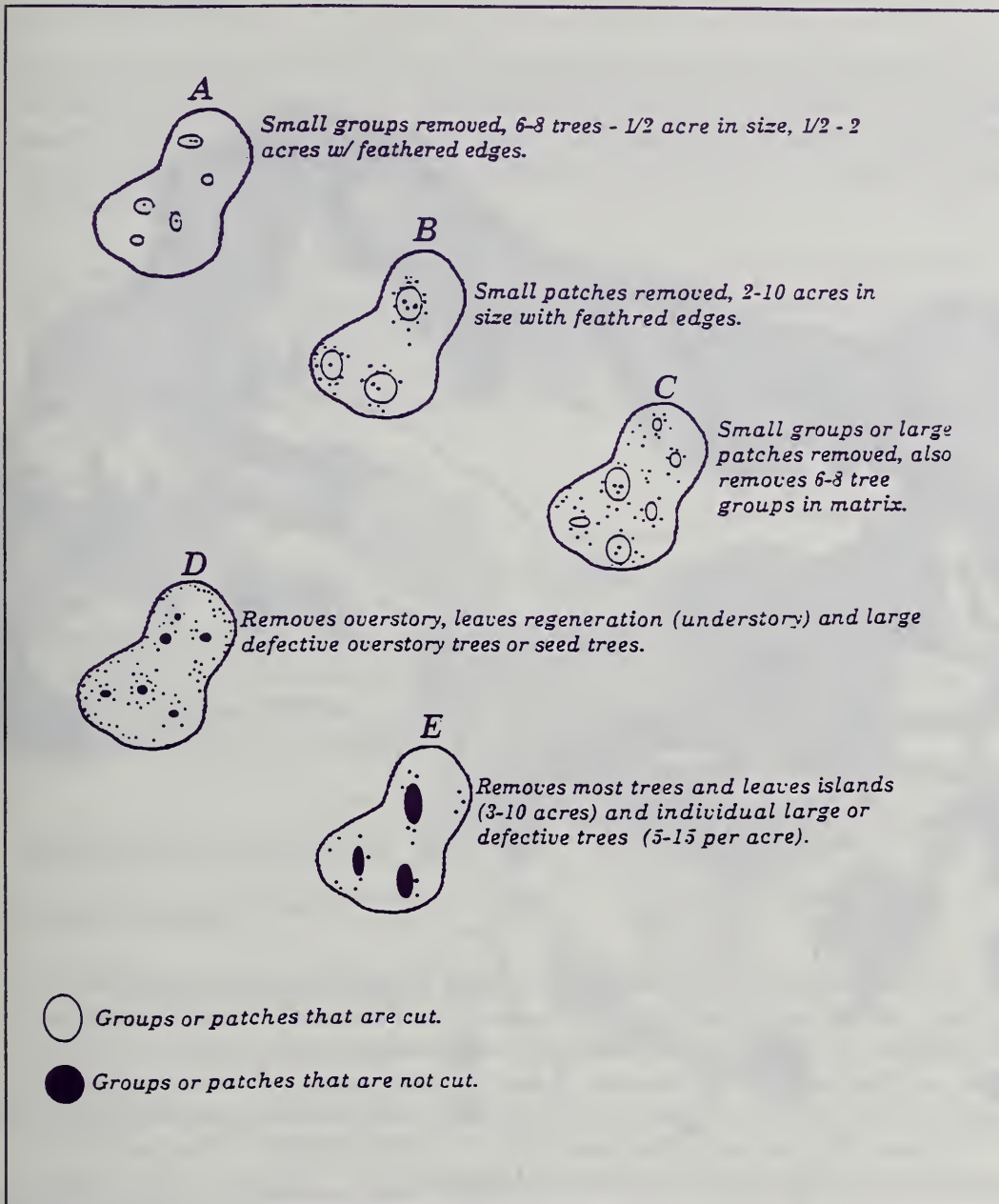
We located the boundaries of the two old growth conservation blocks in the Red Mountain and King George areas. We did this by using current forest plan standards to calculate the amount of acres needed in the study area to meet habitat conservation needs. We then located the majority of this "retention" in the two areas recommended from the landscape analysis. Stream, estuary and beach buffers were also added.

We determined the location of the remaining commercial forest land and divided it up into areas that could be roaded, logged with skyline systems or would have to be logged with helicopter. This helped us determine what was technically 'possible' to achieve with current logging systems.

With the above as a base, we then examined the kind of landscape pattern we wanted to establish by harvesting areas and leaving varying amounts of trees (heavy, medium and light tree retention). Heavier tree retention is designed along riparian corridors, the area between the Red Mountain and King George estuary and steeper slopes that are more visible. Light tree retention is designed for areas that had fairly high productivity and few resource concerns. Moderate tree retention is designed for areas that had potential wildlife dispersal areas and moderately steep, visible slopes. We developed general prescriptions or harvest methods to help meet the structural retention goals for the land units (see Figure A-6). We also identified some areas to add to the old growth retention network, under the guidelines of the current Forest Plan.

## A - Landscape Analysis and DFC

Figure A-6: General Harvest Prescriptions



The last step identified the rate of harvest that was desirable within each land unit. This resulted in harvest acreage thresholds every 35-50 years. The results of the desired condition analysis are summarized by land unit, starting on page A-11. The conditions described were incorporated into the purpose and need for the King George Timber Sale and each alternative.

## A - Landscape Analysis and DFC

Figure A-7: Desired Future Condition



# A - Landscape Analysis and DFC

## Porcupine Gulch Land Unit

### Existing Condition:

This area is named for the predominance of porcupine activity which keeps most of the vegetative productivity cycling in small trees or highly defective large trees. In addition, most of this land unit contains unstable slopes. A stream passes through the middle of this land unit and contributes to the shallow marine bench near Honeymoon Creek. This area can be seen from Zimovia Strait.

There are approximately 73 acres of available land for harvest, but of this only 1/3 or 24 acres are considered manageable at this time. This is due to the predominance of low volume stands, heavy defect from porcupine activity, and the need to manage this area with helicopters. Approximately 210 acres would be retained on steep slopes and in the beach fringe, and an additional 48 acres will be retained because it is unmanageable at this time.

### Desired Future Conditions:

- Maintain landscape character and meet Partial Retention VQO.
- The desired vegetative condition would maintain the status quo. Of the manageable lands, 24 acres would be available for harvest within the first 50 years. Harvest methods would include B and C, thereby retaining a moderate amount of residual structure within the managed stands (see Figures A-6 and A-7).

## Zimovia Face Land Unit

### Existing Condition:

This land unit faces toward Wrangell Island's Zimovia Highway. It contains a high percentage of higher volume class stands which makes it valuable commercially and as habitat for ungulates. One small anadromous stream was found within this land unit. An existing harvest unit is approximately 160 acres in size and approximately 35 years old. Natural disturbance factors include small patches of blowdown, cedar decline and minor porcupine activity. A high percentage of cedar occurs within this land unit, some of which is dying. In addition, a concentration of culturally modified trees occurs near the beach.

Within this unit approximately 504 acres are both available and capable of being managed through timber harvest at this time. This includes approximately half of the existing 160 acre clear-cut which is outside the beach fringe. In this land unit, 216 acres will be retained in an old growth condition.

### Desired Future Condition:

- ◆ The desired vegetative condition is to maintain at least 50% of the existing forested habitat in an old growth or mature (100+ years old) condition, with heavy to medium residual structure, for ungulate habitat and to serve some of the needs of species dependent upon snags and variable vegetative structure. Future thinning of harvested beach fringe could restore these values more readily.

## A - Landscape Analysis and DFC

- ◆ The desired visual condition will meet the Partial Retention VQO from Zimovia Strait and Zimovia highway. It is estimated that no more than 80-100 acres can be treated at one time prior to visual recovery, which is estimated to take 35-40 years in this land unit. The current harvest unit is not visually recovered. Heavy to medium residual structure (see Figures A-6 and A-7) is planned to be left within managed stands. This accounts for the high number of acres estimated to be treated in a single entry because harvest can be “feathered” into the landscape. This condition could be better achieved, and a larger number of acres treated at one time (approx. 100 acres), if a helicopter is used for yarding. If cable systems are used, a lower number of acres (approx. 70-80 acres) can be treated each entry, because the units would appear more noticeable.
- ◆ The above conditions would result in treating approximately 1/5 or 80- 100 acres of the manageable land every 35 years. For modeling purposes, the rotation is assumed to be 175 years.

### Chichagof Land Unit

#### Existing Condition:

This land unit is characterized by north-facing, steep slopes. The predominant natural disturbance factors in this area are small patches of blowdown (up to 1 acre in size) and some porcupine damage, particularly in western hemlock. Stand composition varies widely in species distribution, structure and commercial value. The entire land unit is visible from the ferry route and partially visible from the Zimovia travel routes.

Presently, there are approximately 1377 acres available for timber harvest within this land unit. However, an estimated 25% is not capable of supporting harvest operations due to pockets of steep rocky terrain and areas incapable of supporting helicopter yarding. Therefore, 1033 acres are considered manageable and 939 acres will be retained (595 high hazard/beach fringe retention acres plus 344 unmanageable acres).

#### Desired Condition:

- ◆ The desired vegetative condition is to maintain a diverse structure and species composition, thereby, mimicking the existing condition, through time. Gradually, a younger forest will result on 1/2 the land unit over approximately 200 years. Increases in commercial productivity of trees is expected by managing for medium to medium/large diameter classes. A mix of young and older, large diameter trees will be retained in managed areas. However, the species composition should remain at existing proportions.
- ◆ Largely contiguous, unfragmented landscapes composed of predominantly multi-storied stands is desired through time. While managed stands may not be “old-growth,” they will provide thermal cover, forage and some of the structural components of old growth. An optimum harvest strategy would treat a mix of medium and heavy residual structure areas each entry (see Figures A-6 and A-7).
- ◆ A variety of harvest prescriptions will be used to achieve a multi-storied stand and the appearance of a large-scale texture change or “feathered” look across the entire landscape. The same acre of land may be entered more than once, to achieve the desired condition. Large treatment areas which appear feathered (>100 acres), are

## A - Landscape Analysis and DFC

preferred over smaller “blocks” or more visible forms in the landscape. Harvest prescriptions A-D, will be utilized in combination to achieve the desired result.

- ◆ These areas will be managed to produce scenery, wildlife habitat and sawlogs. Western hemlock is the predominant species, but spruce and cedar are also present. Pockets of cedar appear throughout this land unit and should be retained through time. Harvest prescriptions should maintain some degree of natural stocking control. Due to potential porcupine activity, precommercial thinning is not expected to be required. If thinning does become necessary, it could be timed to occur with harvest.
- ◆ To achieve the Partial Retention VQO, no more than 15% of the viewshed will appear modified at a time. Complete visual recovery of treated areas is assumed take 35-40 years. The “rotation” of any treated area is assumed to be 200 years for modeling purposes.
- ◆ Approximately 1033 acres are expected to be harvested over the next 200 years. This will leave approximately 939 acres in an original “old growth” condition along the beach, small streams, and in extremely steep, or unstable slope areas, which can not be feasibly harvested. Since the rotation is assumed to be 200 years, and no more than 15% of the land unit is to be treated at any one time, we estimate that 200-300 acres can be treated every 40 years. This assumes re-entry into the same acre in some areas. Such treatments should be distributed across the face in both heavy and medium residual structure areas (see Figures A-6 and A-7).
- ◆ Logging systems used for harvest will be aerial, allowing greater control, and more flexibility to achieve a multi-storied stand structure.
- ◆ The ability of this area to provide bear denning areas (rocky outcrops, cliffs and large standing or downed trees that have or create cavities) will be maintained by an unroaded condition, and by leaving large trees or a buffer around known or suspected bear denning areas. Eagle nests will be protected by the beach buffer and timing of activities.

### Red Mountain Land Unit

#### Existing Condition:

This land unit is similar to the Chichagof Land Unit in its topography and vegetative condition, except that it is predominantly west facing. The entire land unit is visible from the ferry route. No anadromous streams are present within this land unit. This land unit could be maintained as a travel corridor between old growth blocks within the North Etolin landscape. Its position in the landscape makes it potentially important as a Habitat Conservation Area or as an area for “retention” under current direction. Natural disturbance factors include small patches of blowdown, porcupine damage and landslides.

Under a management strategy that retains this area as a potential HCA, 1183 acres will be retained. Approximately, 176 acres are considered available for harvest but 25% is incapable of supporting helicopter yarding or contains pockets of cliffs and rocky terrain. Thus, 132 acres are considered manageable.

# A - Landscape Analysis and DFC

## Desired Future Condition:

- ◆ The desired future vegetative condition is to retain the majority of this area in its original old growth condition. This area would also meet the requirements for a small Habitat Conservation Area, as outlined in the Viable Population Report.
- ◆ The existing visual character will be Partially Retained with heavy to medium residual structure left in managed areas.
- ◆ The 132 acres of manageable area will be treated as a contiguous area, with harvest prescriptions varying from A-D (see Figures A-6 and A-7).
- ◆ A primary objective within the 132 acre manageable area is to maintain the corridor next to the beach fringe between the King George old growth block and the Red Mountain old growth block. This would also maintain the visual quality of this area from the ferry route and achieve the Partial Retention VQO.

## Upper King George Land Unit

### Existing Condition:

This land unit encompasses the upper reaches of King George Creek, and is very different from the characteristics of the lower King George land unit. Stringers of timber follow King George Creek which meanders through large muskegs. A series of beaver ponds lend to the freshwater system diversity as well as productivity. This stream productivity is available to resident cutthroat and anadromous Dolly Varden char. Side slopes have moderate to high vegetative productivity. Most of the land unit is not visible from saltwater, but is highly visible from the alpine trail corridor to Bessie Peak. Natural disturbance factors are mostly small blowdown patches and porcupine damage.

There are approximately 158 acres of forested lands retained on steep slopes or located within TTRA buffers. There are approximately 696 acres of available and manageable land for timber harvest.

### Desired Future Condition:

- ◆ Vegetation will be managed in large blocks of mostly single-storied stands. Islands, feathering and shaping of these large harvest areas will achieve a VQO of Modification as seen from the potential alpine trail corridor and other recreational use that may occur with the introduction of roads in the VCU. Some structural diversity will be maintained within stands by leaving islands and individual trees of various size-classes. Harvest prescriptions are mainly D and E (see Figures A-6 and A-7).
- ◆ Fragmentation over the first entries will be minimized by harvesting areas at the head of the drainage first.
- ◆ Fifty percent (50%) of this land unit will be maintained in a mature or old growth condition over time for ungulate habitat. To achieve this there are two options; 1) 464 acres may be harvested within the first 50 years leaving 232 acres of the available land unharvested for 100 years, or 2) approximately 232 acres could be harvested every 50 years on a 150 year rotation.

## A - Landscape Analysis and DFC

- ◆ Roads built within this land unit may be closed after timber harvest. Closures appear to be justified because of the periodic entry, reduced maintenance costs and to meet habitat and water quality objectives.
- ◆ The productivity of Upper King George Creek and the beaver ponds will be maintained by road management objectives/placement, TTRA buffers and leaving heavy residual structure in managed stands within the riparian corridor. Productivity of the upper King George freshwater system can be enhanced by introducing salmon and steelhead by blasting the barrier at the northern end of the land unit.

### Lower King George Land Unit

#### Existing Condition:

The Lower King George land unit is highly productive for fish, wildlife, marine life, and vegetation. Historically, the estuary has attracted people because of the subsistence, scenery, recreation and timber resource values. Natural disturbance factors include landslides, flooding, small blowdown and porcupine activity. The estuary, riparian corridors, and south-facing slopes (<500' elev.), are the most productive areas within this land unit for fish and wildlife. Dispersal/travel corridors for wildlife within this unit are primarily located along riparian zones or sideslopes (elevational corridors for ungulates are especially important on south facing slopes). This land unit is divided by King George Creek into north and south facing areas. South facing stands have a higher habitat value for most wildlife species. King George Creek is a cold stream due to topographic and vegetative shading. There is a partial barrier to anadromous fish on the upstream boundary of this land unit.

Overall 2016 acres are retained in their original old growth condition (1952 acres retention plus 64 acres considered unmanageable). Available lands constitute 940 acres, 876 acres of which is estimated to be manageable for timber using a variety of harvest methods.

#### Desired Condition:

- ◆ For habitat conservation and biodiversity, a large "old growth" block will be retained in this land unit on the south facing slope near the King George Estuary. This area is over 1600 acres in size with approximately 900 acres in volume class 4 and above stands. This unit should be managed in an unroaded condition over time.
- ◆ At least sixty percent (60%) of this land unit will be retained in an old growth or mature habitat condition over time. Approximately 876 acres is considered available for harvest, with 365 acres in the north-facing side and 511 acres in the south-facing side, and could be harvested with a mix of harvest prescriptions. Of these 876 acres, 186 acres within the King George Creek riparian corridor will be managed to achieve old growth (300 year rotation).
- ◆ Upland South Facing: The remainder of the upland, south facing area will be a mix of single and multi-storied stands. There are approximately 400 acres of upland, south facing slopes available and manageable for harvest. For modeling purposes, it is assumed that 1/4 of these acres will be harvested every 50 years. Managed stands will reach the age of 200 before being considered for harvest again. Openings will be managed by "feathering" them into existing stands. Islands and shaping of managed

## A - Landscape Analysis and DFC

stands will be used to increase both visual and structural diversity. Managed stands will be long and thin (with aerial logging on top, and cable logging further down slope) to maintain elevational travel corridors and mimic natural slide patterns. This area should be managed to minimize the fragmentation of the adjacent block of old growth, and roads used for harvest within this area may be closed after harvest or minimized to reduce access to interior habitat.

- ◆ Upland North Facing: Will be managed for sawlogs, wildlife habitat, scenery and recreation. The existing trail corridor to the alpine and Bessie Peak may eventually be developed. The existing trail corridor will be buffered and the existing vegetative condition will be maintained. Views of the land unit from the trail corridor will meet the visual quality objective of Modification to Partial Retention. Approximately 321 acres, of the available and manageable lands will be managed as a mix of single storied and multi-storied stands. For modeling purposes, 1/4 (25%) of the available forest land is assumed to be harvested every 50 years, in order to provide visual diversity, allow for visual recovery and keep forage values relatively stable over time. An alternative approach is to harvest 1/2 (50%) of the available land every 100 years, allowing for extended recovery time between entries. Managed stands will reach the age of 200 years before being considered for harvest.
- ◆ The road management strategy will be to keep the road on the south side of King George Creek open for small sale activity, but minimize habitat fragmentation and road construction by working toward the west.
- ◆ Water based recreation values near the estuary will be retained as semi-primitive, since this area overlaps with the large, retention area. Foreground scenery will be retained and middle ground scenery will be partially retained from this popular recreation place.
- ◆ The floodplain of King George creek will be buffered by 100 feet (TTRA buffers). Between this buffer and the road, stands will be managed with smaller, dispersed patches of harvest with heavy residual structure (see Figures A-6 and A-7) with an extended rotation of 300 years (approximately 35 acres, treated every 50 years). This area will be managed for a high percentage of spruce, and high value sawlog or specialty products. Pruning, planting and thinning are all activities which may occur in these stands. King George Creek may benefit by an increase in overall stream productivity due to the increase in diffused light near the stream channel.

### Honeymoon Land Unit

#### Existing Condition:

The existing vegetative and natural disturbance factors are similar to the King George land units. This land unit is also predominantly north-south facing, but Honeymoon Creek does not have as much anadromous stream and does not have as significant an estuary. There is a distinctive stand ("Honeymoon Stand") of volume class 6 and 7 timber, predominantly composed of spruce, with some cedar on the south slope. It is distinctive for its volume, composition and its rare juxtaposition (upland slope) in the landscape. The north facing side of the land unit is predominated by high hazard soils. The Honeymoon valley faces toward Zimovia Highway on Wrangell Island and there are oblique views of the land unit from residences along this highway.

## A - Landscape Analysis and DFC

Overall, there are approximately 564 acres which will be retained in an old growth condition and approximately 808 acres (includes the 65 acre Honeymoon Stand) which is both available and manageable for harvest. Most of the land capable of supporting timber harvest is on the south-facing side of Honeymoon Creek.

### Desired Future Condition:

- ◆ This land unit contains the best site for a log transfer facility (see Appendix D for log transfer facility information). A mainline road system could be located on either side of Honeymoon Creek. A location on the south-facing side would favor timber access and economics while a location on the north-facing side may favor wildlife use of the south-facing habitat, water quality and possibly lower road maintenance costs over time.
- ◆ This area has the only other potential large block of contiguous, "old growth," which could meet the small HCA requirements outlined in the Viable Population Report. However, given that this land unit contains the best area in the VCU for a log transfer site, this would mean that a road would likely bisect the block in order to harvest interior areas. This large block is also not as valuable as the King George block from a habitat conservation standpoint, because it has less anadromous stream and less estuary.
- ◆ Sixty percent (60%) of this land unit will be retained in an old growth or mature condition over time (100+ years). Approximately 808 acres is considered available and manageable for harvest.
- ◆ Harvest activities should seek to minimize the fragmentation of the Volume class 6/7 stand (Honeymoon Stand) on the south-facing side over the first few entries. The portion of the stand that is volume class 7 could be unique enough to justify retaining a portion of it. Approximately 104 acres of riparian habitat would be managed under a 300 year rotation (17 acres harvested every 50 years). Combined with retention areas, there will be a small block of old growth retained near the mouth of Honeymoon Creek.
- ◆ Upland North Facing: There are 191 acres of manageable land out of only 254 acres of available lands for timber harvest. Thus 358 total acres of north-facing habitat will be retained. Manageable lands can be harvested at any time by methods that leave medium residual structure since the manageable acres are visible from the Wrangell Island and Zimovia travelways.
- ◆ Upland South Facing: There are approximately 513 acres of south-facing upland outside the riparian corridor, that will be a mix of single and multi-storied stands. For modeling purposes it is assumed that 1/3 of these acres (169 acres), will be harvested every fifty years, under a 150 year rotation. Openings will be "feathered" into existing stands. Harvest units will be long and thin (with aerial logging on top and further down slope cable logging), to maintain elevational travel corridors and mimic natural slide patterns. This pattern will also help achieve the desired VQO of Partial Retention. Approximately 206 acres will be retained in their original old growth condition.

### Summary and Derivation of Acreage and Volume for the Purpose and Need

We determined the manageable acres available for harvest over time in each land unit based on forest plan direction. Each land unit within the study area has its own unique factors that contributed to the amount of structure that is desirable to retain within the area, and the anticipated rotation lengths. In general, land units that are highly visible would receive lighter harvest prescriptions, more frequent entries, and longer overall rotations than areas that are unseen. Also, areas with higher wildlife values such as the valley bottoms would be managed under longer rotations and receive lighter harvest prescriptions such as small group selections rather than large clearcuts. Several assumptions were made regarding rotation lengths. Interior areas with light retention would have larger openings created and would be managed for a 100 to 150 year rotation. Areas with high visual concerns would have rotations of 175 to 200 years. Areas within riparian corridors would be managed on a 250 to 300 year rotation.

Rotation ages and harvest prescriptions would allow for a maximum sustained harvest of approximately 1/3 of the manageable acres every 50 years. We combined the desired future condition of all the land units, and when we summed the acres available for harvest this entry, we determined that approximately 1300 acres could be harvested within the first 50 years. This level of harvest will maintain adequate wildlife habitat and scenic values as well as retain enough harvestable old growth acres for a second and third entry in the next 100 years.

Development of an alternative that builds no roads within the study area generally limits available harvest acres to those areas that are less than one mile from saltwater. It is rarely economically feasible to exceed helicopter yarding distances of one mile. Combining the results of the desired future condition modeling for just the areas within one mile of saltwater resulted in a total of approximately 600 acres that could be managed within the first 50 years, and still maintain a sustainable yield over the rotation.

These modeled acres are basically the "clearcut equivalent" acres that could be treated each entry. Use of structural retention within units, small group selections and individual tree marking could increase the treatment acres without increasing the harvest volume. For example, in an area that is managed for a two aged stand, initial harvest within a 100 acre stand may remove 50 % of the volume through small group selection and individual tree harvest. This would result in 100 acres treated, but only 50 acres of modeled harvest. The other 50 acres would be removed in either the second or third entry. For this reason, the 600 to 1300 acre harvest range may result in a slightly larger treatment acreage for any given entry. Using an average of 25 MBF per acre results in an approximate volume range of 15 million to 30 million board feet in the first 50 years. It is anticipated that the upper threshold would be reduced up to 20 % to allow for near future small sales along the established road system. The lower threshold would not be reduced for small sales, since no roads would be constructed from which a small operator could harvest. This produces a desired range of 15 - 25 MMBF on the first entry into the King George Study Area.

# **Appendix B**

## **Unit and Road Cards, and Extra Alternative Maps**

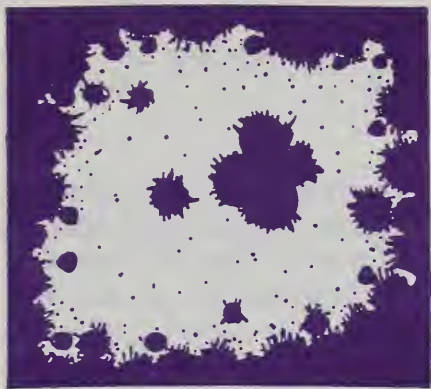


# Appendix B

UNIT 2017 Final Report  
of the 2017-2018  
Study

Page 1

## Overview and Sideview of Various Harvest Methods



Clearcut w/ retention



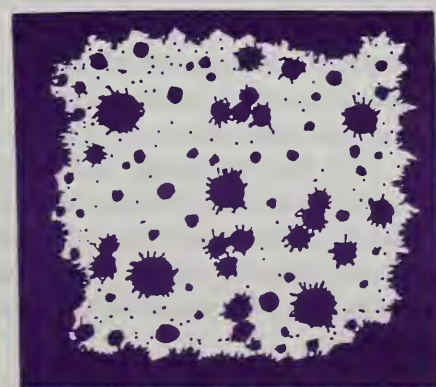
Individual tree w/ 30% retention



Individual tree w/ 50% retention



Group selection w/ 70% retention



Overstory removal w/ 10% retention



Patch cut w/ retention

King George Timber Sale      Unit Number 1      In Alternative 1, 2, 3, 4, 5

Compartment 156      VCU 462      Total Acres 306      Harvest Acres 69  
Harvest method helicopter      Volume Harvested 1535 MBF

**EXISTING CONDITION:**

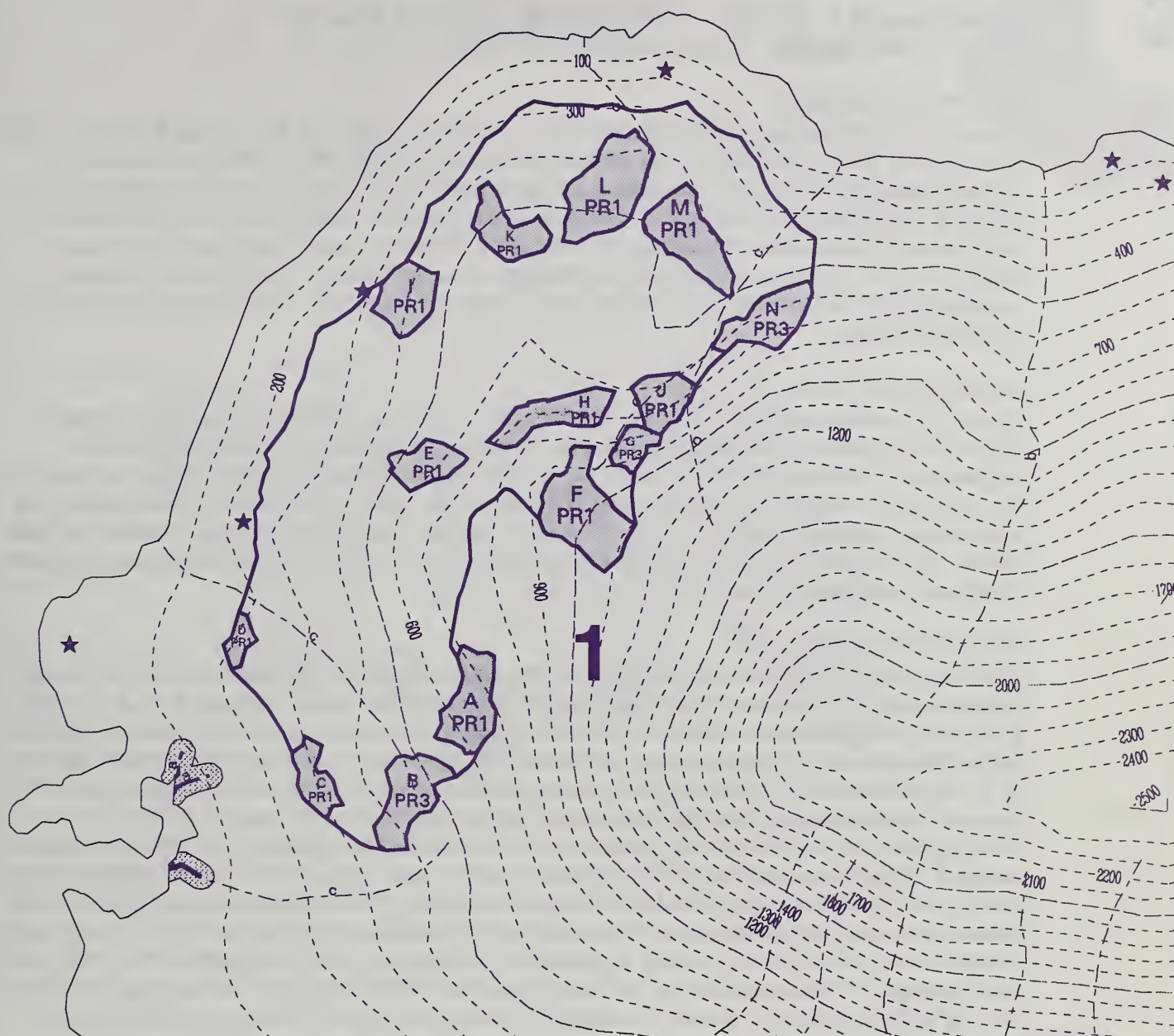
This unit is located in the Chichagof land unit. This area is visible from Stikine Strait and the Alaska Marine Highway route; the area is visible from local small boat lanes and sport fishing areas, as well as the King George estuary. To people in the estuary, the area is at the toe slope of a mountain and appears to have rolling terrain with several steeper slopes. Blowdown in patches up to 1/2 acre are dispersed in the area particularly the northern part of the stand. Porcupine activity is fairly high in the hemlock. There are five class III streams within this unit, and 20 acres of high hazard soil. About half of the unit contains high quality deer winter habitat in the southern part of the unit and lower elevations.

**DESIRED CONDITION:**

Harvest and regenerate small areas within the larger unit over a period of 150 years, 4-5 times. Harvest will maintain a moderate to high amount of tree retention. This will reduce the level of fragmentation of the Chichagof and lower King George forest block, maintain ungulate winter range while creating small dispersed patches of usable forage. Maintain ability of the stand to provide dispersal for wildlife within the large forest block and the King George estuary area. Harvest will mimic natural vegetative patterns created by wind. Maintain stilted root trees of any species, snags, trees with large branches (greater than 3") for nesting platforms and large diameter trees with heart rot for cavity nesting birds. Maintain slope stability and water quality. Recreation and ferry/cruise ship passengers may notice harvest, but it should appear small, like natural disturbance dispersed over the landscape.

**PRESCRIPTION DIRECTION:**

This stand will be managed utilizing uneven-aged management. Harvest patches of timber between 2-8 acres in size. Sections A, C, D, E, F, H, I, J, K, L, & M will be harvested by patch cut while retaining at least 10% of the basal area. Sections B, G, & N will be harvested by patch cut while retaining at least 30% of the basal area. Sections B, G and N will retain more basal area because they are larger, more visible and contain healthy medium/small sized trees. Harvest patches should generally run parallel with the contours in the landscape in random groups and the edges of the patches should coincide with natural changes in the stand. This will mimic natural vegetative patterns as well as "feather" the harvest areas into the adjacent stand. Retention in the patches should be of three types: 1. Intermediate sized trees that are healthy and which will release. 2. Seed trees of yellow-cedar, redcedar and spruce; 3. Large, old, stilted rooted and heart rot trees effective as future snags; nesting & perching wildlife trees. The boundary of the patches should be as windfirm as possible, particularly adjacent to streams in sections J, G, M and N. Some windthrow may occur but should not expand existing harvest area over 10%. All streams will be protected by stream course protection clause 'c'. Inventoried high hazard soil areas in sections F, G, J, & N are moderately sloped areas adjacent to unstable hillslopes above the unit boundary. Risk of slope failure in the harvest areas is low. Opening up the canopy will make residual trees more susceptible to windthrow, which could cause slope failure. Harvested patches are at least 1000' from the estuary and at least 330' from 3 eagle nest sites adjacent to the boundary. Regeneration of the patches will be natural seeding from boundary trees and seed trees within the unit. Future stand treatments may involve limited thinning or sanitation to favor spruce, cedar and growth of trees with good form for timber. These treatments will also seek to maintain 10-30% of the trees as future snags and large trees for structural diversity. In order to achieve this, some areas within the unit may be left untreated.



- |       |                                |     |                         |
|-------|--------------------------------|-----|-------------------------|
|       | Proposed Roads                 |     | Proposed cut units      |
|       | Class 1 Streams                |     | Adjacent proposed units |
|       | Class 2 Streams                |     | TTRA Buffers            |
|       | Class 3 Streams                |     | Saltwater and Lakes     |
|       | Eagle Nest Tree                |     |                         |
|       | Proposed Log Transfer Facility |     |                         |
| a,b,c | Stream Protection Level        | A   | Section                 |
|       |                                | PR1 | Prescription            |

Scale: 4 inches = 1 mile

King George Timber Sale   Unit Number 2   In Alternative 1, 2, 3, 4, 5

Compartment 156   VCU 462   Total Acres 297   Harvest Acres 297  
Harvest method helicopter   Volume Harvested 3707 MBF

**EXISTING CONDITION:**

The unit is visible Chichagof pass and Zimovia Strait. The unit is located in the Chichagof land unit. Most of the unit lies in two small valleys with steep mountain slopes dividing them. There are five class III streams within this unit. Stream sideslopes in the upper portion of section C are actively eroding. There is extensive porcupine activity and bole rot within the western hemlock. There are existing small pockets of hemlock sawfly in the northern portion of this unit, along the unit boundary. There are a few areas of blowdown in the northern portion of the unit, consisting of approximately 1-3 acres in size. This unit contains about 50 acres of soil types with very high hazard stability rating. This unit also contains 26 acres of forested wetlands.

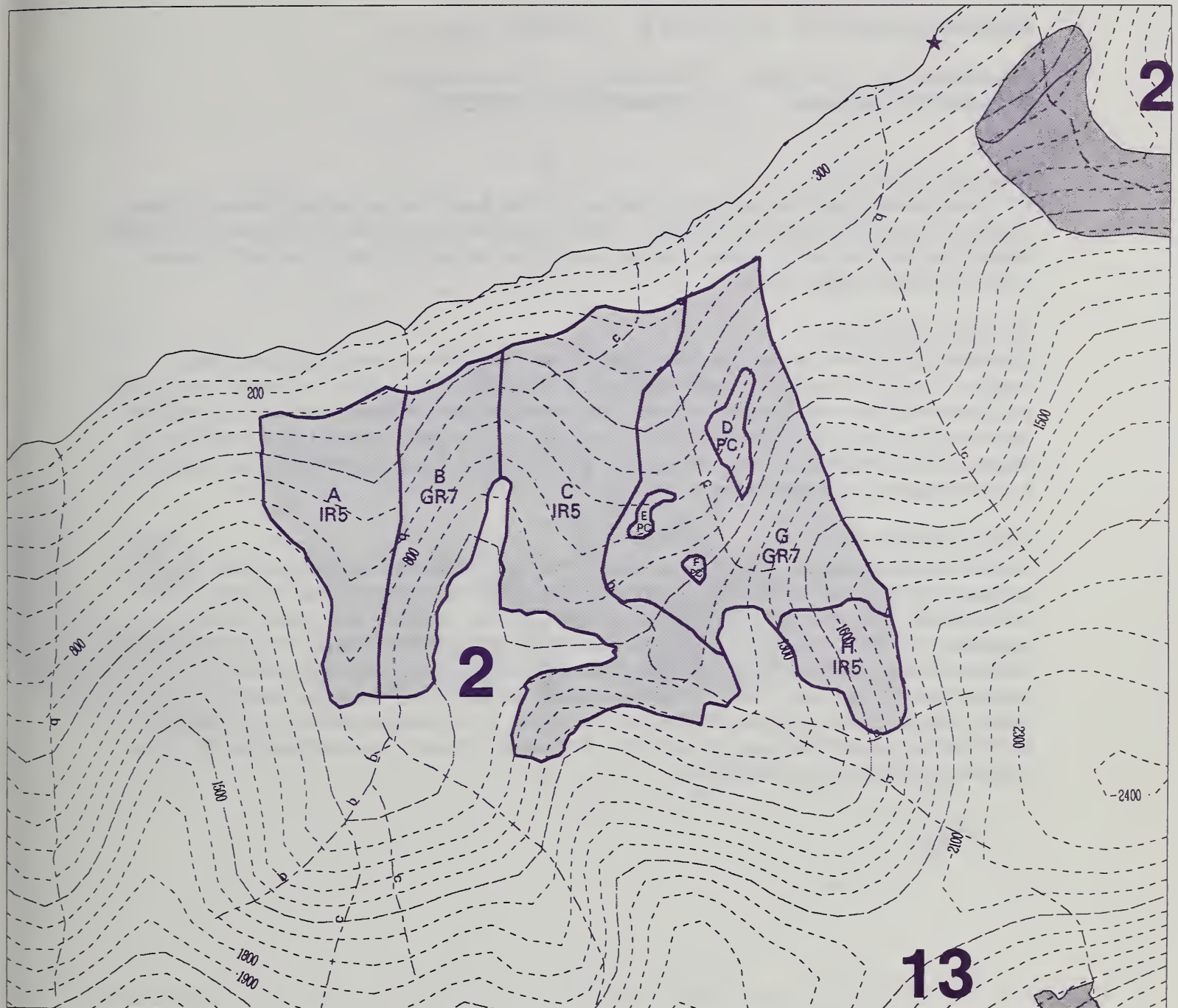
**DESIRED CONDITION:**









The desired condition of this unit is to harvest timber over a 150 year rotation and meet partial retention. Harvest will maintain a moderate to high amount of retention through the unit, which will minimize fragmentation. Maintain stilted root trees of any species, snags, trees with large branches (greater than 3") for nesting platforms and large diameter trees with heart rot for cavity nesting birds. Harvest activity will mimic natural vegetative patterns such as blowdown or disease pockets. Maintain slope stability and water quality. Recreational and ferry/cruise ship passengers may notice harvest, but it should appear as a natural disturbance dispersed over the landscape.

**PRESCRIPTION DIRECTION:**

The objectives of this unit can best be met by uneven-aged management. The unit is divided into several sections in order to implement harvest prescriptions in the following manner. Sections A, C, & H will be harvested by individual tree selection while retaining 50% of the basal area over these sections. Sections B & G will be harvested by group selection and retain 70% of the basal area within these sections. Section D, E, F, will be harvested by patch cut while retaining seedtrees of yellow-cedar and Sitka spruce whenever possible. Retention should be as windfirm as possible, particularly along 'b' streams. It is not possible to build a road to this unit from the LTF, therefore it will be harvested by helicopter. The affect on forested wetlands will be low because they will be helicopter yarded. Areas with soil types that are rated very high hazard stability will only be harvested where slopes are less than 75%, to minimize potential slope failure. Regeneration of the harvested areas will be natural seeding by adjacent trees and seed trees. Future stand treatments may involve limited thinning or sanitation to favor spruce, cedar and growth of trees with good form for timber. These treatments will also seek to maintain 10-30% of the trees as future snags and large trees for structural diversity. In order to achieve this, some areas within the unit may be left untreated. Protection of streams are shown on unit map. Avoid additional sideslope disturbance.

Harvest in this stand will not create any openings greater than 100 acres.



- |  |                                |   |                         |
|--|--------------------------------|---|-------------------------|
|  | Proposed Roads                 |  | Proposed cut units      |
|  | Class 1 Streams                |  | Adjacent proposed units |
|  | Class 2 Streams                |  | TTRA Buffers            |
|  | Class 3 Streams                |  | Saltwater and Lakes     |
| ★  | Eagle Nest Tree                | A   | Section                 |
| E  | Proposed Log Transfer Facility | PR1   | Prescription            |
| a,b,c  | Stream Protection Level        |   |                         |

Scale: 4 inches = 1 mile

**King George Timber Sale**    Unit Number 3    In Alternative 1, 4, 5

Compartment 156    VCU 462    Total Acres 35    Harvest Acres 35  
Harvest method helicopter    Volume Harvested 665 MBF

**EXISTING CONDITION:**

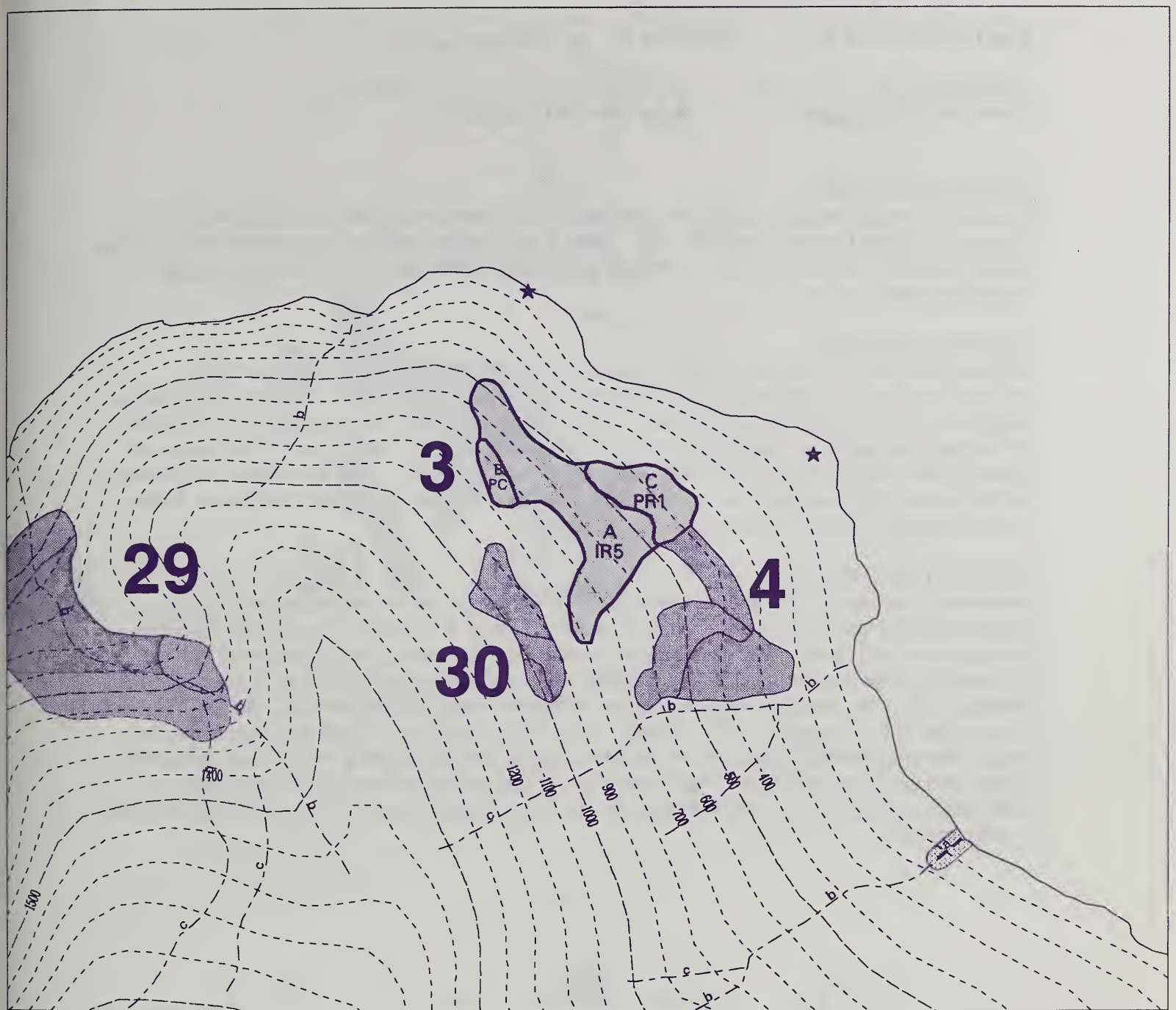
The unit is located in the Zimovia Face land unit and is visible from Zimovia Strait and Zimovia highway. There are no mapped streams within this unit. There is extensive porcupine activity and bole rot within the western hemlock. This unit is located within high quality deer habitat and a third of this unit is located within high quality marten habitat.

**DESIRED CONDITION:**

The desired condition of this unit is to harvest timber over a 100-150 year rotation and meet partial retention. Harvest will maintain a moderate amount of retention. Maintain stilted root trees of any species, snags, trees with large branches (greater than 3") for nesting platforms and large diameter trees with heart rot for cavity nesting birds. Harvest activity will mimic natural vegetative patterns such as blowdown or disease pockets using the helicopter. Recreational and ferry/cruise ship passengers may notice harvest, but it should appear as a natural disturbance.

**PRESCRIPTION DIRECTION:**

The unit will be managed as an uneven-aged stand. The unit is divided into several sections in order to implement harvest prescriptions in the following manner. Section A will be harvested by individual tree selection which will retain 50% of the basal area over this section. Section B will be harvested by clearcutting. Section C will be harvested by individual tree selection while retaining 10 % of the basal area. Retention should be as windfirm as possible. Regeneration of harvested areas will be naturally seeded by adjacent trees and seed trees. Future stand treatments may involve limited thinning or sanitation to favor spruce, cedar and growth of trees with good form for timber. These treatments will also seek to maintain 10-20% of the trees as future snags and large trees for structural diversity. In order to achieve this, some areas within the unit may be left untreated.



Proposed Roads



Class 1 Streams



Class 2 Streams



Class 3 Streams



Eagle Nest Tree



Proposed Log Transfer Facility

a,b,c

Stream Protection Level



Proposed cut units



Adjacent proposed units



TTRA Buffers



Saltwater and Lakes

A

Section

PR1

Prescription

Scale: 4 inches = 1 mile

**King George Timber Sale**      Unit Number 4      In Alternative 1, 4, 5

Compartment 156    VCU 462                      Total Acres 24                      Harvest Acres 24  
Harvest method helicopter                      Volume Harvested 440 MBF

**EXISTING CONDITION:**

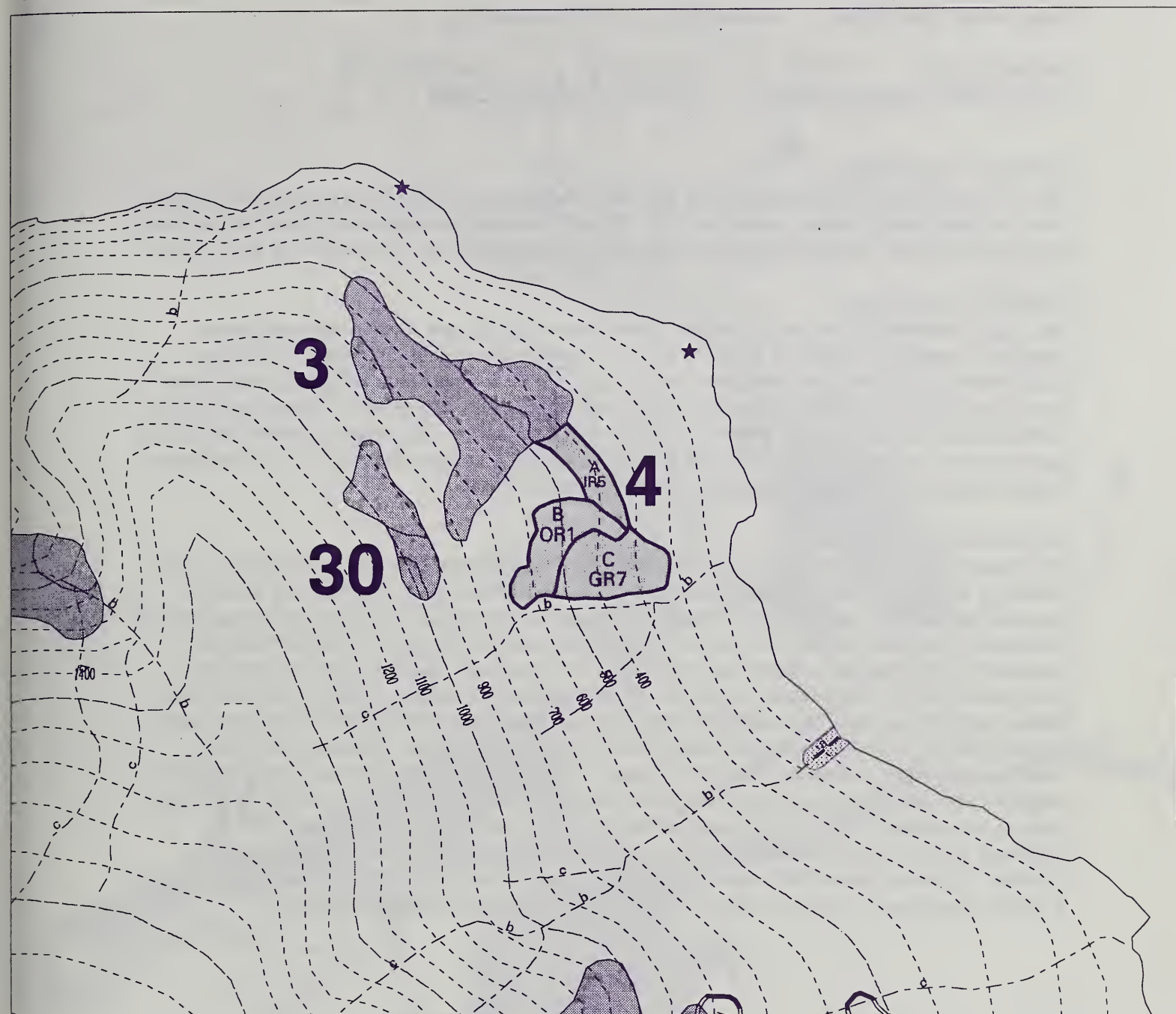
The unit is located in the Zimovia Face land unit and is visible from Zimovia Strait and Zimovia highway. There are no mapped streams within this unit. There is extensive porcupine activity and bole rot within the western hemlock. This unit is located within high quality deer habitat and a third of this unit is located within high quality marten habitat.

**DESIRED CONDITION:**

The desired condition of this unit is to harvest timber over a 100-150 year rotation and meet partial retention. Harvest will maintain a moderate amount of retention. Maintain stilted root trees of any species, snags, trees with large branches (greater than 3") for nesting platforms and large diameter trees with heart rot for cavity nesting birds. Harvest activity will mimic natural vegetative patterns such as blowdown or disease pockets. Reduce some of the visual impact of the backline in the existing harvest unit. Recreational and ferry/cruise ship passengers may notice harvest, but it should appear as a natural disturbance. Reduce gray tones in the landscape due to cedar decline.

**PRESCRIPTION DIRECTION:**

The unit will be managed as an uneven-aged stand. The unit is divided into several sections in order to implement harvest prescriptions in the following manner. Section A will be harvested by individual tree selection which will retain 50% of the basal area over this section. Section B will be harvested by removing the overstory which consists of yellow-cedar decline. Section C will be harvested by group selection while retaining 70 % of the basal area within this section. Retention should be as windfirm as possible. Regeneration of harvested areas will be naturally seeded by adjacent trees and seed trees from within the unit. Future stand treatments may involve limited thinning or sanitation to favor spruce, cedar and growth of trees with good form for timber. These treatments will also seek to maintain 10-20% of the trees as future snags and large trees for structural diversity. In order to achieve this, some areas within the unit may be left untreated.




 Proposed Roads

 Class 1 Streams

 Class 2 Streams


 Class 3 Streams

 Eagle Nest Tree


 Proposed Log Transfer Facility

a,b,c Stream Protection Level

 Proposed cut units

 Adjacent proposed units

 TTRA Buffers

 Saltwater and Lakes

A Section

PR1 Prescription

Scale: 4 inches = 1 mile

King George Timber Sale      Unit Number 5      In Alternative 4, 5

Compartment 156      VCU 462      Total Acres 50      Harvest Acres 50  
Harvest method cable & helicopter      Volume Harvested 1152 MBF

**EXISTING CONDITION:**

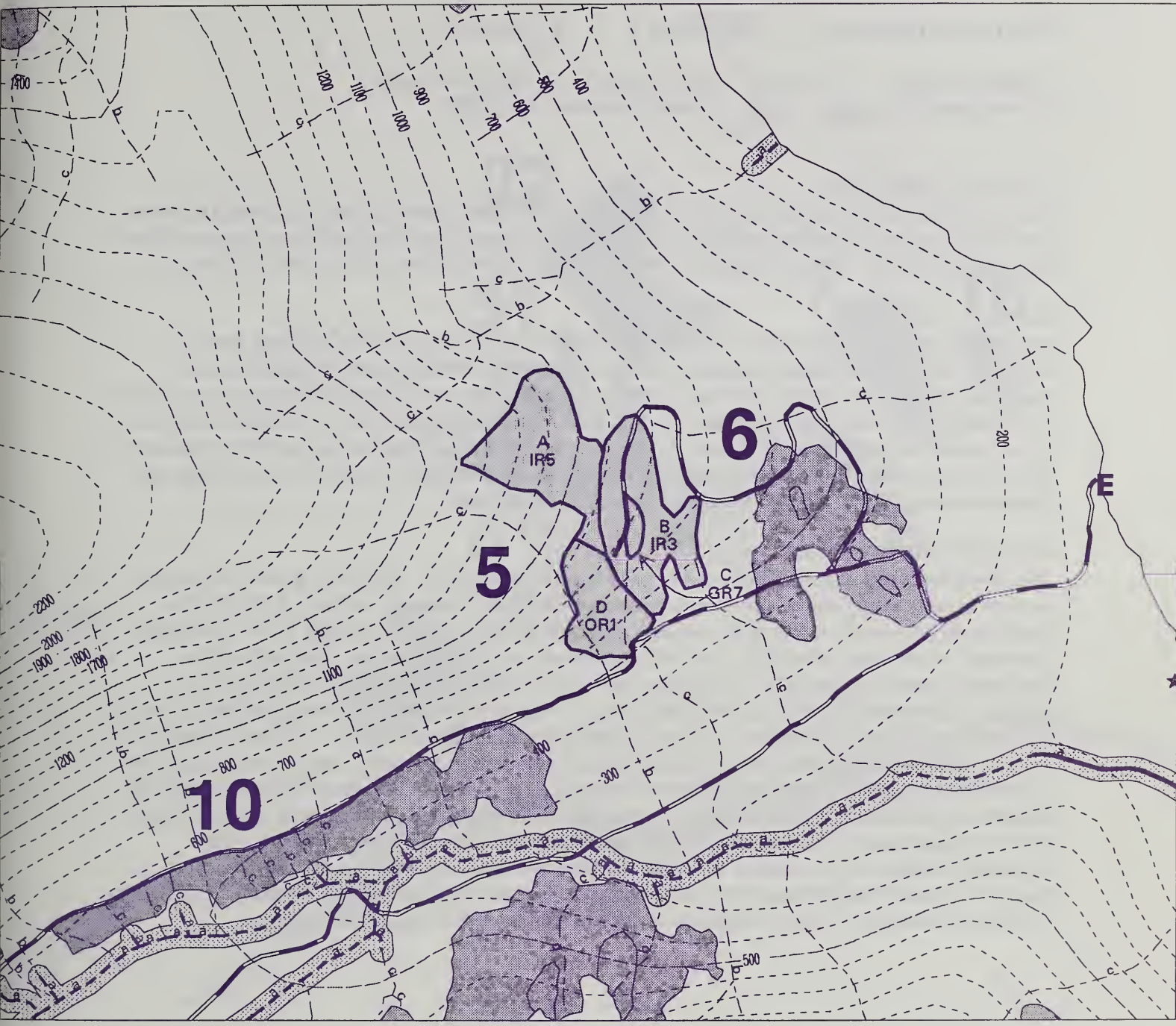
The unit is located in the Zimovia Face land unit and is visible from Zimovia Strait and Zimovia highway. There are three class III streams within this unit. There is extensive porcupine activity and bole rot within the western hemlock. There is a significant amount of cedar decline in the southern portion of this unit.







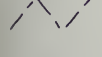


**DESIRED CONDITION:**

The desired condition of this unit is to harvest timber over a 100-150 year rotation and meet partial retention. Harvest will maintain a moderate amount of retention through the unit, which will reduce fragmentation. Maintain stilted root trees of any species, snags, trees with large branches (greater than 3") for nesting platforms and large diameter trees with heart rot for cavity nesting birds. Harvest activity will mimic natural vegetative patterns such as blowdown or disease pockets. Recreational and ferry/cruise ship passengers may notice harvest, but it should appear as a natural disturbance dispersed over the landscape. Maintain stream channel stability and minimize sideslope disturbance.

**PRESCRIPTION DIRECTION:**

The objectives of this unit can best be met by uneven-aged management. The unit is divided into several sections in order to implement harvest prescriptions in the following manner. Sections A & D will be harvested by helicopter because of the visibility and steepness of the slope. Section A will be harvested by individual tree selection which will retain 50% of the basal area over this section. Section B will be harvested by individual tree selection and retain 30% of the basal area. Section C will be harvested in groups and retain 70% of the basal. Section D will be harvested by overstory removal to harvest cedar decline within this section. Not cutting the understory will leave about 10 % retention within this section. This unit will be perceived as a gradual change over time from travel routes. Retention should be as windfirm as possible, particularly adjacent to streams. Regeneration of harvested areas will be naturally seeded by adjacent trees and seed trees from within the unit. Future stand treatments may involve limited thinning or sanitation to favor spruce, cedar and growth of trees with good form for timber. These treatments will also seek to maintain 10-30% of the trees as future snags and large trees for structural diversity. In order to achieve this, some areas within the unit may be left untreated. Protection for streams is shown on unit map. If section D changes to cable, stream protection clauses may change.



- |  |   |
|--|---|
|  Proposed Roads  |  Proposed cut units      |
|  Class 1 Streams |  Adjacent proposed units |
|  Class 2 Streams |  TTRA Buffers            |
|  Class 3 Streams |  Saltwater and Lakes     |
|  Eagle Nest Tree  | <b>A</b> Section  |
| <b>E</b> Proposed Log Transfer Facility  | <b>PR1</b> Prescription   |

a,b,c Stream Protection Level

Scale: 4 inches = 1 mile

King George Timber Sale

Unit Number 5

In Alternative 1

Compartment 156

VCU 462

Total Acres 63

Harvest Acres 63

Harvest method helicopter

Volume Harvested 1316 MBF

#### EXISTING CONDITION:

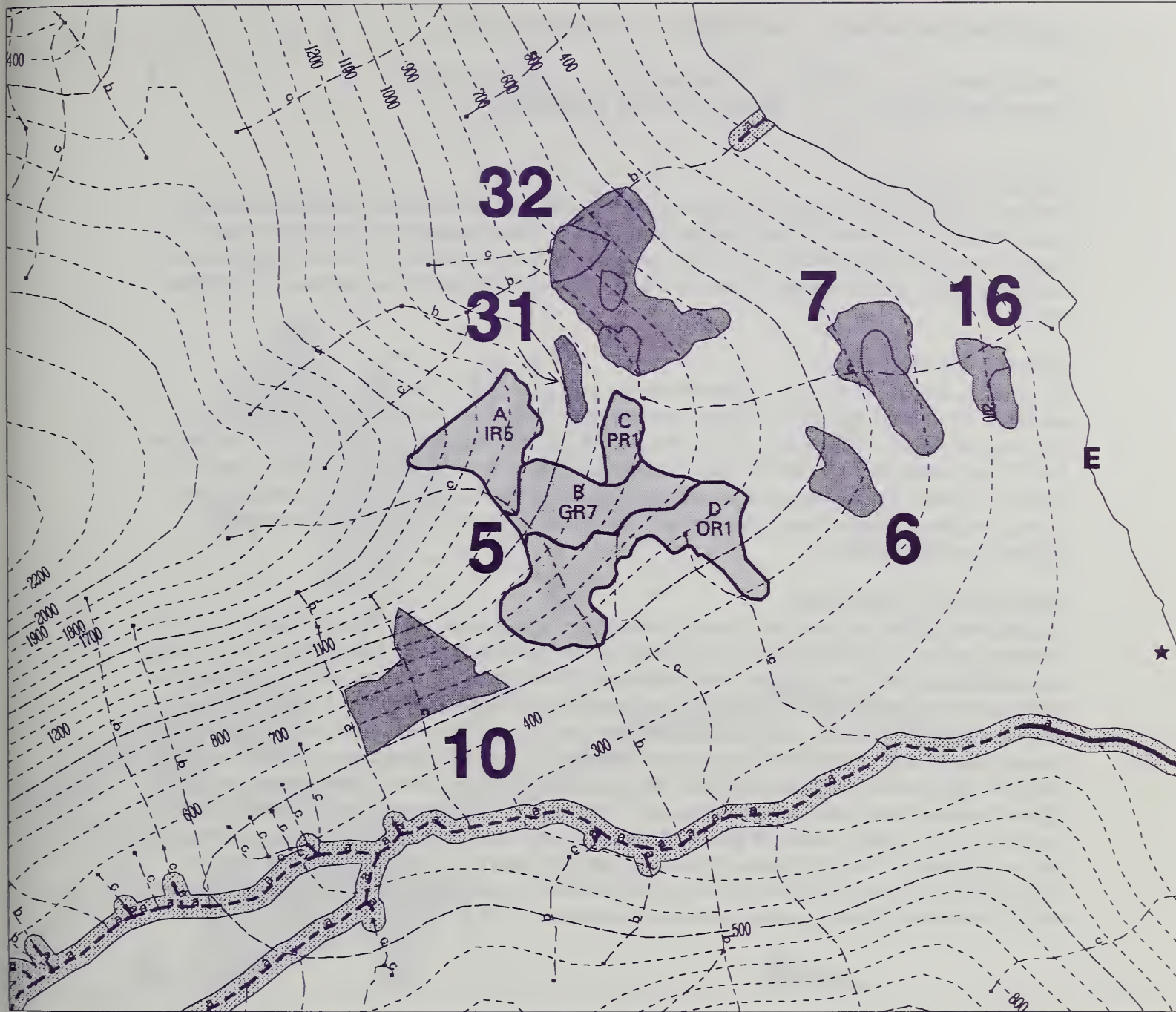
The unit is located in the Zimovia Face land unit and is visible from Zimovia Strait and Zimovia highway. There are three class III streams within this unit. There is extensive porcupine activity and bole rot within the western hemlock. There is a significant amount of cedar decline in the southern portion of this unit.







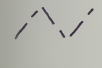


#### DESIRED CONDITION:

The desired condition of this unit is to harvest timber over a 100-150 year rotation and meet partial retention. Harvest will maintain a moderate amount of retention through the unit, which will reduce fragmentation. Maintain stilted root trees of any species, snags, trees with large branches (greater than 3") for nesting platforms and large diameter trees with heart rot for cavity nesting birds. Harvest activity will mimic natural vegetative patterns such as blowdown or disease pockets. Recreational and ferry/cruise ship passengers may notice harvest, but it should appear as a natural disturbance dispersed over the landscape. Maintain stream channel stability and minimize sideslope disturbance.

#### PRESCRIPTION DIRECTION:

The objectives of this unit can best be met by uneven-aged management. The unit is divided into several sections in order to implement harvest prescriptions in the following manner. Sections A & D will be harvested by helicopter because of the visibility and steepness of the slope. Section A will be harvested by individual tree selection which will retain 50% of the basal area over this section. Section B will be harvested in groups and retain 70% of the basal area. Section C will be harvested by individual tree selection and retaining 10 % of the basal area. Section D will be harvested by overstory removal harvesting the cedar decline within this section. Not cutting the understory will leave about 10 % retention within this section. This unit will be perceived as a gradual change over time from travel routes. Retention should be as windfirm as possible, particularly adjacent to streams. Regeneration of harvested areas will be naturally seeded by adjacent trees and seed trees from within the unit. Future stand treatments may involve limited thinning or sanitation to favor spruce, cedar and growth of trees with good form for timber. These treatments will also seek to maintain 10-30% of the trees as future snags and large trees for structural diversity. In order to achieve this, some areas within the unit may be left untreated. Protection for streams is shown on unit map. If section D changes to cable, stream protection clauses may change.



- |  |                                |   |                            |
|--|--------------------------------|---|----------------------------|
|  | Proposed Roads                 |  | Proposed cut prescriptions |
|  | Class 1 Streams                |  | Adjacent proposed units    |
|  | Class 2 Streams                |  | TTRA Buffers               |
|  | Class 3 Streams                |  | Saltwater and Lakes        |
|   | Eagle Nest Tree                | <b>A</b>  | Section                    |
| <b>E</b>   | Proposed Log Transfer Facility | <b>PR1</b>  | Prescription               |
| <b>a,b,c</b>   | Stream Protection Level        |   |                            |

Scale/ 4 inches = 1 mile

**King George Timber Sale**      Unit Number 6      In Alternative 3, 4, 5

Compartment 156      VCU 462      Total Acres 32      Harvest Acres 32  
Harvest method cable      Volume Harvested 688 MBF

**EXISTING CONDITION:**

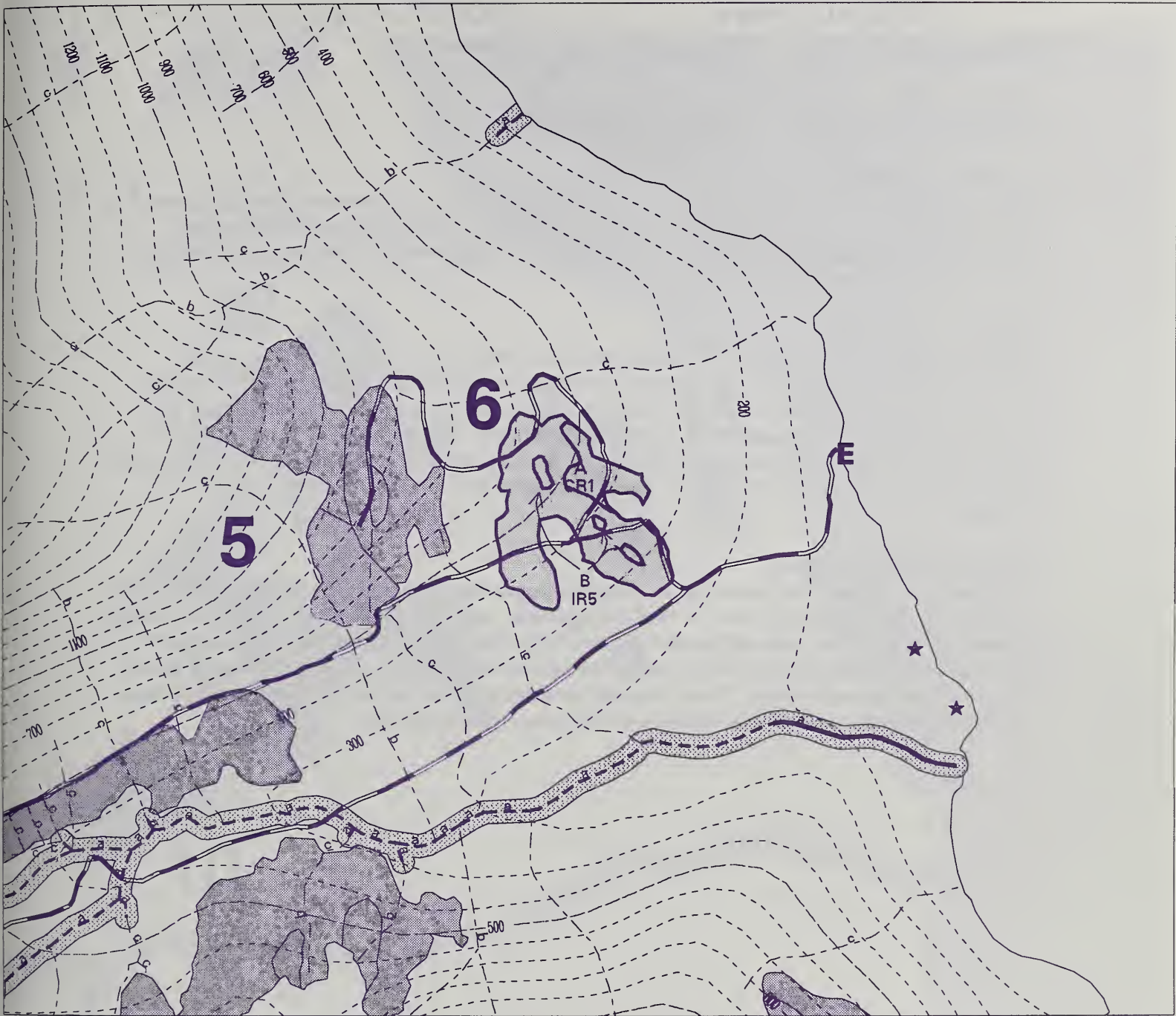
The unit is located in the Honeymoon land unit and is visible from Zimovia Strait and Zimovia highway, Nemo road and Pat's Creek LTF on Wrangell Island. There are no mapped streams within this unit. There is extensive porcupine activity and bole rot within the western hemlock. There are some culturally modified redcedar within this unit. There are 2 acres of forested wetlands in the southeast corner of this unit.

**DESIRED CONDITION:**

The desired condition of this unit is to harvest timber over a 100-150 year rotation and meet partial retention. Harvest will maintain a slight to moderate amount of retention through the unit, which will reduce visual impacts. Maintain stilted root trees of any species, snags, trees with large branches (greater than 3") for nesting platforms and large diameter trees with heart rot for cavity nesting birds. Harvest activity will mimic natural vegetative patterns such as blowdown or disease pockets. Recreational and ferry/cruise ship passengers may notice harvest, but it should appear as a natural disturbance pattern dispersed over the landscape.

**PRESCRIPTION DIRECTION:**

The objectives of this unit can best be met by uneven-aged management. This unit is divided into several sections in order to implement harvest prescriptions in the following manner. Sections B, C, D & E will be harvested by individual tree selection which will retain 50% of the basal area over these sections. Section A will be harvested by individual tree selection and retain 10% of the basal area. The 2 acres of forested wetlands will be harvested by cable to avoid soil disturbance or special consideration will be taken in shovel logging layout. In the cable option, logging slash may be YUM yarded and separated, chipped or burned. Retention should be as windfirm as possible. Regeneration of harvested areas will be naturally seeded by adjacent trees and seed trees from within the unit. Future stand treatments may involve limited thinning or sanitation to favor spruce, cedar and growth of trees with good form for timber. These treatments will also seek to maintain 5-10% of the trees as future snags and large trees for structural diversity. In order to achieve this, some areas within the unit may be left untreated. Leave culturally modified trees and smaller healthy trees around them in groups to minimize windthrow.



- |  |                                |  |                         |
|--|--------------------------------|--|-------------------------|
|  | Proposed Roads                 |  | Proposed cut units      |
|  | Class 1 Streams                |  | Adjacent proposed units |
|  | Class 2 Streams                |  | TTRA Buffers            |
|  | Class 3 Streams                |  | Saltwater and Lakes     |
|  | Eagle Nest Tree                |  |                         |
|  | Proposed Log Transfer Facility |  |                         |

a,b,c Stream Protection Level

A Section  
PR1 Prescription

Scale: 4 inches = 1 mile

King George Timber Sale

Unit Number 6

In Alternative 1

Compartment 156 VCU 462

Total Acres 6

Harvest Acres 6

Harvest method helicopter

Volume Harvested 126 MBF

**EXISTING CONDITION:**

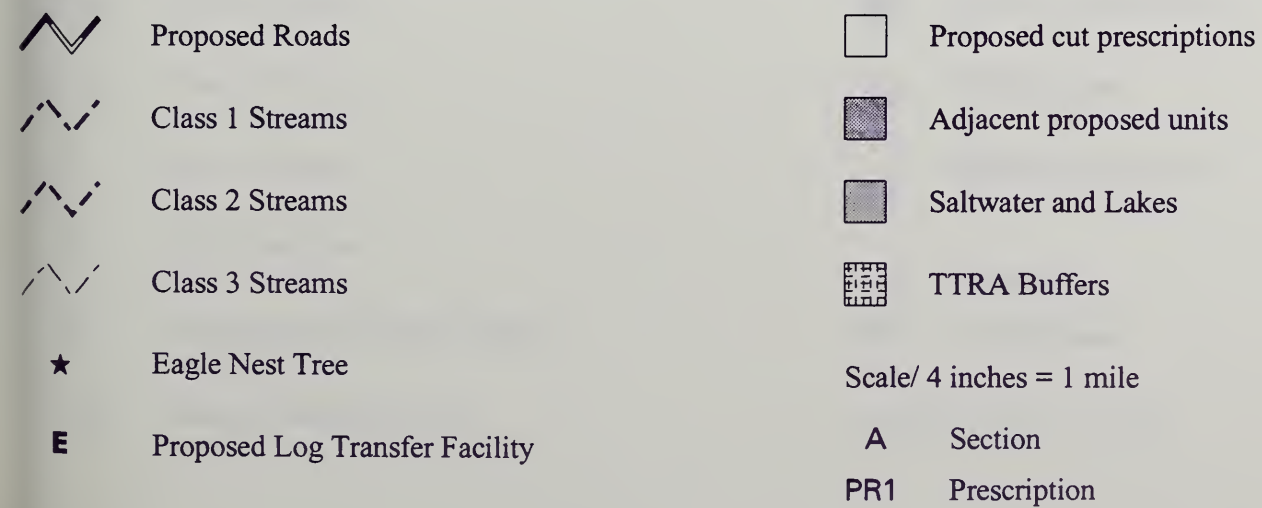
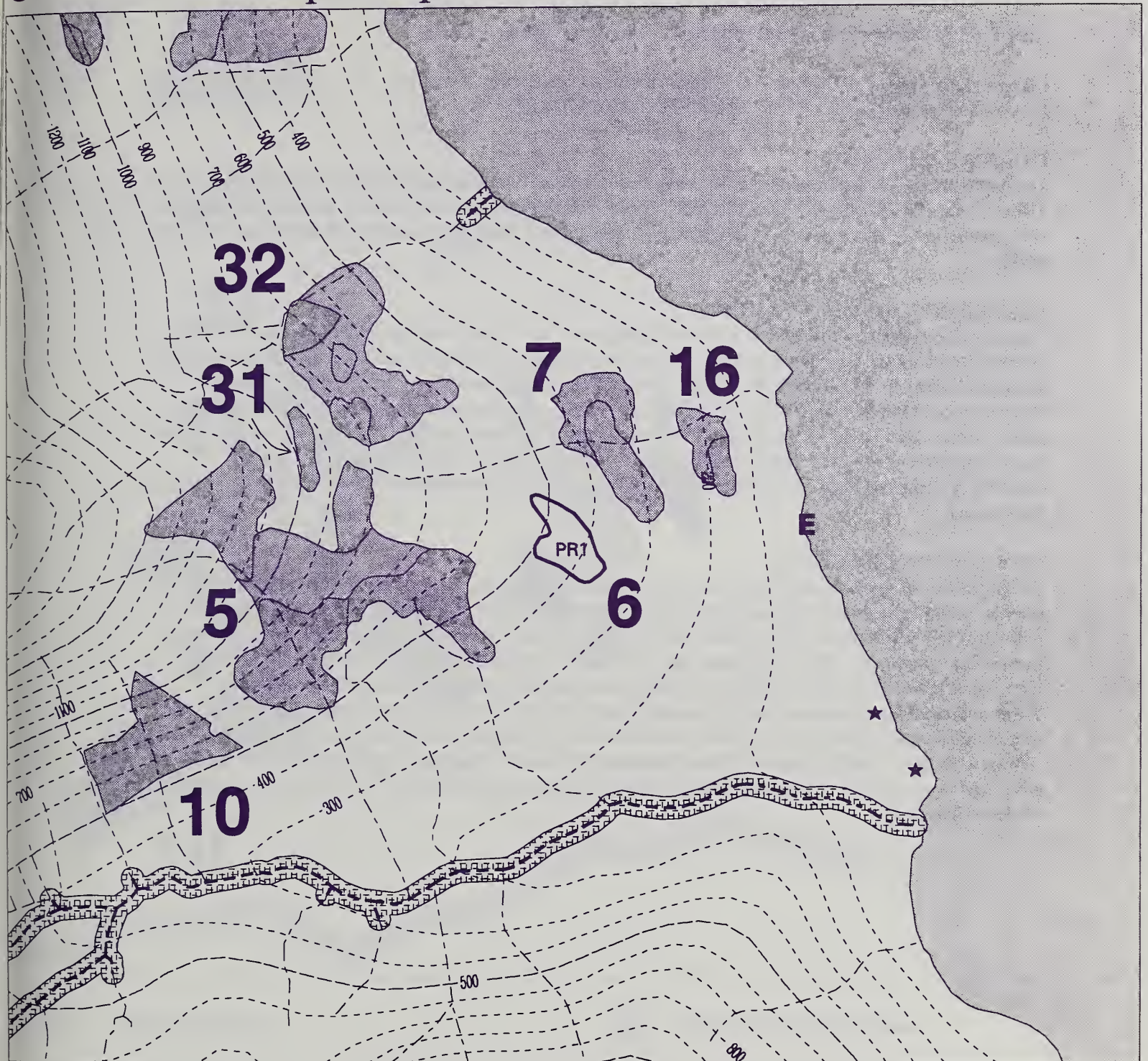
The unit is located in the Honeymoon land unit and is visible from Zimovia Strait and Zimovia highway, Nemo road and Pat's Creek LTF on Wrangell Island. There are no mapped streams within this unit. There is extensive porcupine activity and bole rot within the western hemlock. There are some culturally modified redcedar within this unit.

**DESIRED CONDITION:**

The desired condition of this unit is to harvest timber over a 100-150 year rotation and meet partial retention. Harvest will maintain a slight amount of retention through the unit, which will reduce visual impacts. Maintain stilted root trees of any species, snags, trees with large branches (greater than 3") for nesting platforms and large diameter trees with heart rot for cavity nesting birds. Harvest activity will mimic natural vegetative patterns such as blowdown or disease pockets. Recreational and ferry/cruise ship passengers may notice harvest, but it should appear as a natural disturbance pattern dispersed over the landscape.

**PRESCRIPTION DIRECTION:**

The objectives of this unit can best be met by either a two-aged stand management. This prescription will use individual tree selection and retain 10 % of the basal area. Retention should be as windfirm as possible. Regeneration of harvested areas will be naturally seeded by adjacent trees and seed trees from within the unit. Future stand treatments may involve limited thinning or sanitation to favor spruce, cedar and growth of trees with good form for timber. Leave culturally modified trees and smaller healthy trees around them in groups to minimize windthrow in the helicopter and shovel yarding methods.



**King George Timber Sale   Unit Number 7   In Alternative 1**

Compartment 156   VCU 462   Total Acres 14   Harvest Acres 14  
Harvest method helicopter   Volume Harvested 270 MBF

**EXISTING CONDITION:**

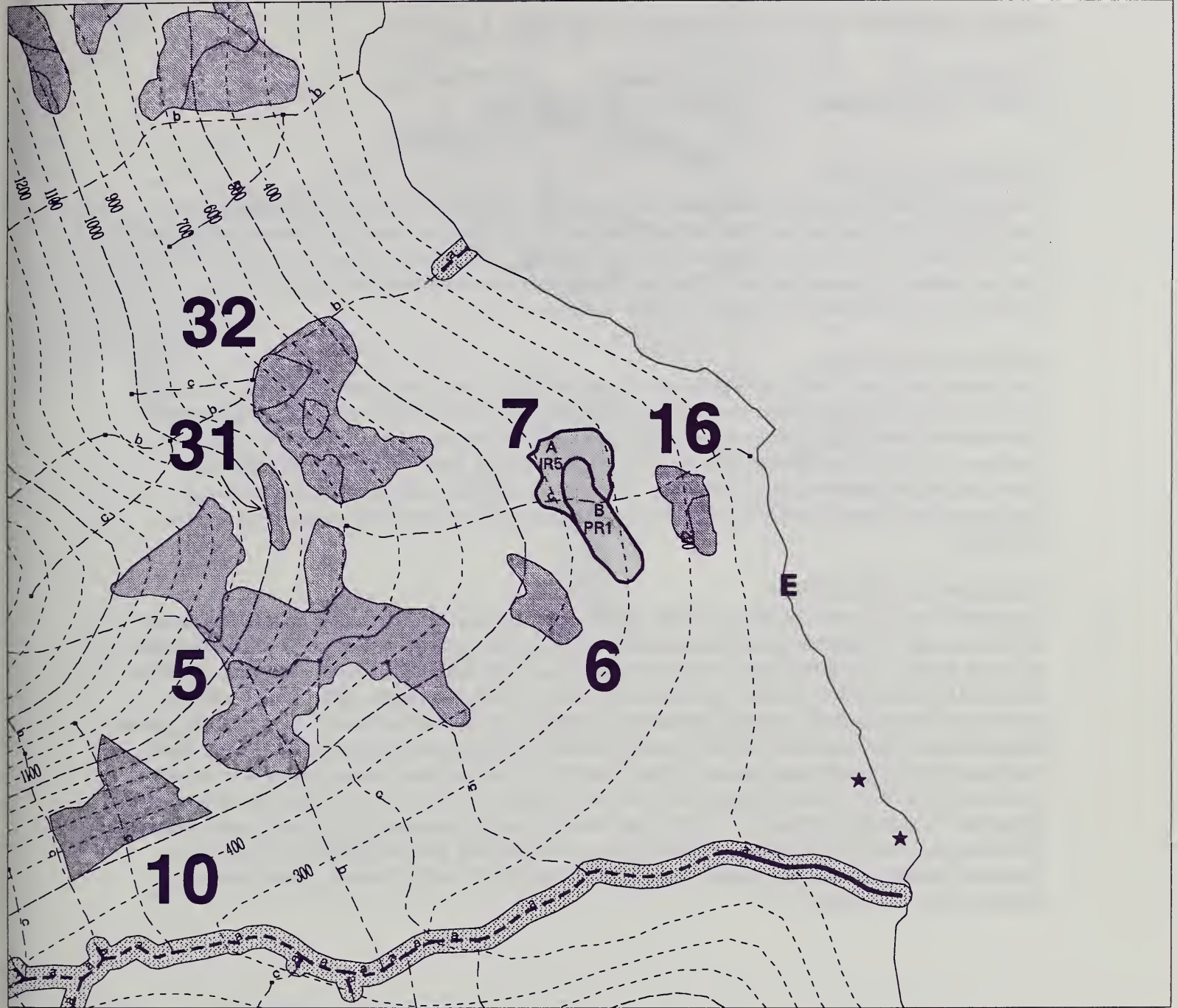
The unit is located in the Honeymoon land unit and is visible from Zimovia Strait and Zimovia highway. There is one class III stream within this unit. There is extensive porcupine activity and bole rot within the western hemlock. This unit is located within high quality deer, black bear, marten, elk and brown creeper habitat.

**DESIRED CONDITION:**

The desired condition of this unit is to harvest timber over a 100 year rotation and meet partial retention. Harvest will maintain a moderate amount of retention through the northern portion of the unit and a slight amount of retention in the southern portion. Maintain stilted root trees of any species, snags, trees with large branches (greater than 3") for nesting platforms and large diameter trees with heart rot for cavity nesting birds. Harvest activity will mimic natural vegetative patterns such as blowdown or disease pockets. Recreational and ferry/cruise ship passengers may notice harvest, but it should appear as a natural disturbance dispersed over the landscape. Reduce some of the visual impact of the backline in the existing harvest unit.

**PRESCRIPTION DIRECTION:**

The objectives of this unit can best be met by two-aged management. The unit is divided into two sections in order to implement harvest prescriptions in the following manner. Sections A will be harvested by individual tree selection which will retain 50% of the basal area. Section B will be harvested by individual tree selection and retain 10% of the basal area. This unit will be perceived as a gradual change over time from travel routes. Retention should be as windfirm as possible, particularly adjacent to the stream. Regeneration of harvested areas will be naturally seeded by adjacent trees and seed trees from within the unit. Future stand treatments may involve limited thinning or sanitation to favor spruce, cedar and growth of trees with good form for timber. These treatments will seek to maintain 5-10% of the trees as future snags and large trees for structural diversity. Streamcourse protection clause 'c' will be applied to the stream in this unit.



- |   |                                |     |                            |
|---|--------------------------------|-----|----------------------------|
|   | Proposed Roads                 |     | Proposed cut prescriptions |
|   | Class 1 Streams                |     | Adjacent proposed units    |
|   | Class 2 Streams                |     | TTRA Buffers               |
|   | Class 3 Streams                |     | Saltwater and Lakes        |
| ★ | Eagle Nest Tree                |     |                            |
| E | Proposed Log Transfer Facility |     |                            |
|   |                                | A   | Section                    |
|   |                                | PR1 | Prescription               |

a,b,c Stream Protection Level

Scale/ 4 inches = 1 mile

**King George Timber Sale**    Unit Number 8    In Alternative 1, 3, 4, 5

Compartment 156    VCU 462    Total Acres 26    Harvest Acres 26  
Harvest method helicopter    Volume Harvested 268 MBF

**EXISTING CONDITION:**

The unit is located in the Honeymoon and Porcupine Gulch land unit. This unit is visible from Zimovia Strait, Zimovia highway and a couple of the Nemo campsites. There are no mapped streams within this unit, however, a class III stream borders the unit to the north. There is extensive porcupine activity and bole rot within the western hemlock. There are 16 acres of forested wetlands within this unit. The landscape in this area has a low ability to absorb changes.

**DESIRED CONDITION:**

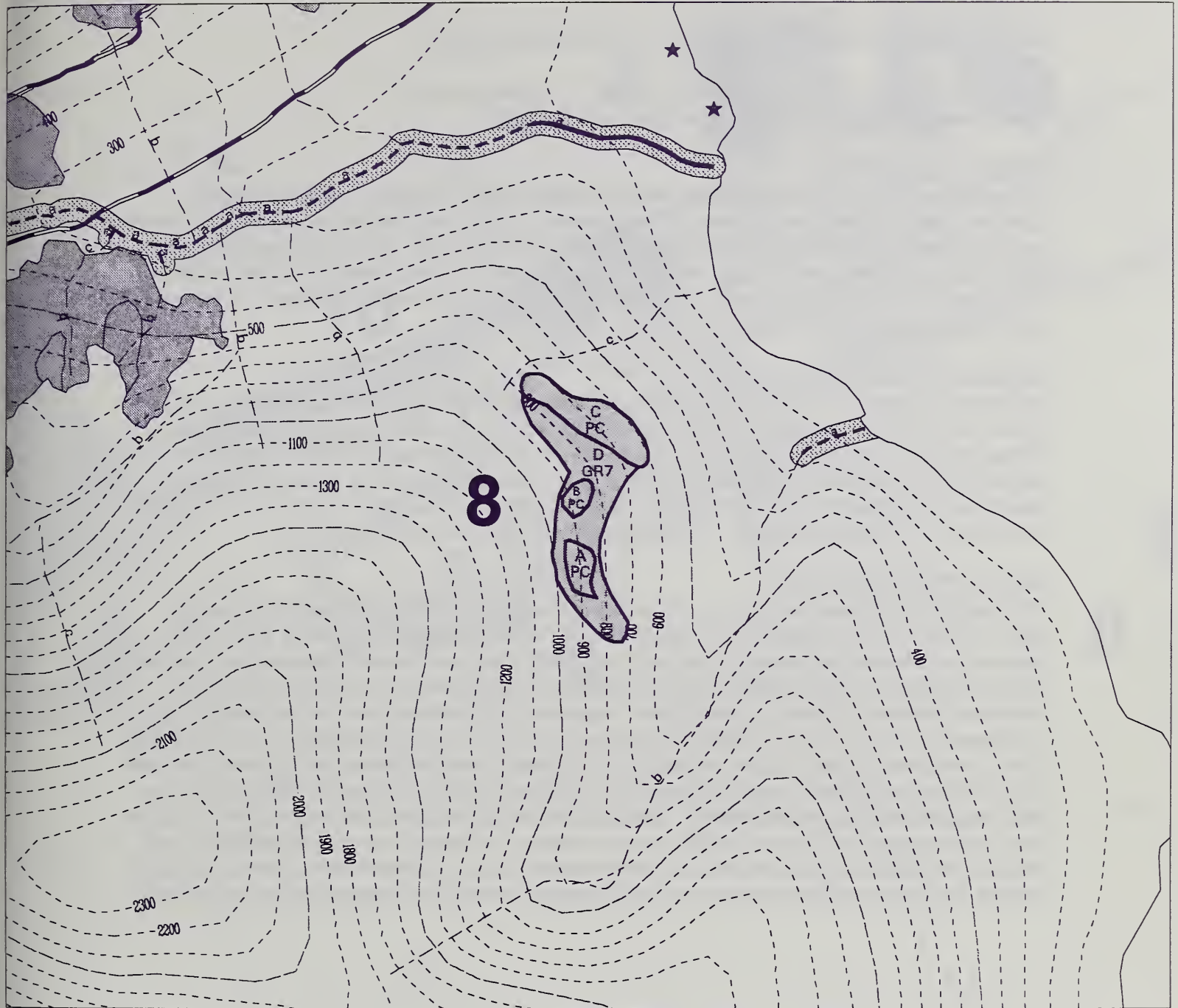
The desired condition of this unit is to harvest timber over a 150 year rotation and meet partial retention. Harvest will maintain a moderate amount of retention through the unit, which will reduce fragmentation. Maintain stilted root trees of any species, snags, trees with large branches (greater than 3") for nesting platforms and large diameter trees with heart rot for cavity nesting birds. Harvest activity will mimic natural vegetative patterns such as blowdown or disease pockets. Recreational and ferry/cruise ship passengers may notice harvest, but it should appear as a natural disturbance pattern dispersed over the landscape.














**PRESCRIPTION DIRECTION:**

The objectives of this unit can best be met by uneven-aged management. The unit is divided into several sections in order to implement harvest prescriptions in the following manner. Section D will be harvested by group selection which will retain 70% of the basal area within this section. Sections A, B and C will be harvested by the seed tree method. Seed trees will consist of western redcedar, yellow-cedar and Sitka spruce when ever possible. Retention should be as windfirm as possible, particularly adjacent to the stream. Regeneration of harvested areas will be naturally seeded by adjacent trees and seed trees. Future stand treatments may involve limited thinning or sanitation to favor spruce, or cedar and growth of trees with good form for timber. These treatments will also seek to maintain 10-30% of the trees as future snags and large trees for structural diversity. In order to achieve this, some areas within the unit may be left untreated. Harvesting this unit is expected to have minor effects to the wetland acres within this unit because of helicopter yarding and the high amount of retention that will be left within the unit. Streamcourse protection will be category 'c'.

# UNIT 8

## Alternatives 1, 3, 4 & 5



- |  |                                |   |                         |
|--|--------------------------------|---|-------------------------|
|  | Proposed Roads                 |  | Proposed cut units      |
|  | Class 1 Streams                |  | Adjacent proposed units |
|  | Class 2 Streams                |  | TTRA Buffers            |
|  | Class 3 Streams                |  | Saltwater and Lakes     |
|  | Eagle Nest Tree                |   |                         |
|  | Proposed Log Transfer Facility |  | Section                 |
|  | Stream Protection Level        |  | Prescription            |

Scale: 4 inches = 1 mile

**King George Timber Sale**    Unit Number 2    In Alternative 1,3,4,5

Compartment 156    VCU 462    Total Acres 76    Harvest Acres 76  
Harvest method helicopter    Volume Harvested 894 MBF

**EXISTING CONDITION:**

The unit is located in the Honeymoon land unit and is visible Zimovia highway. There is extensive porcupine activity and bole rot within the western hemlock. There is cedar decline present in the western part of this stand. There are 24 acres of forested wetlands within this unit. The southern boundary of this unit borders a high hazard soil unit and one acre is included within the unit. This unit contains six class III streams which are tributary to class II habitat. Streams fan out along toe slopes, particularly on the east side of this unit. Stream stability is dependent on large down wood.

**DESIRED CONDITION:**

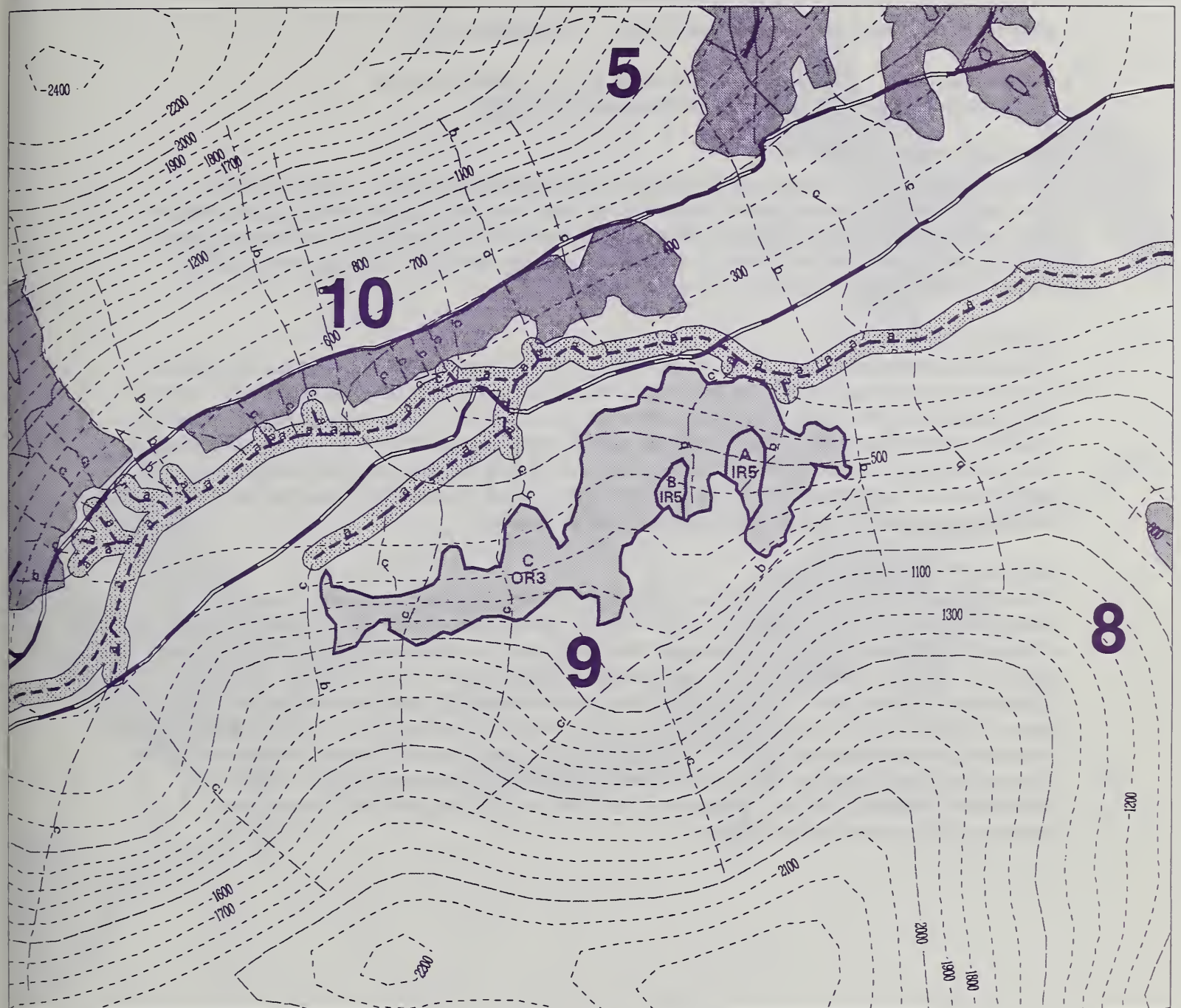
The desired condition of this unit is to harvest timber over a 150 year rotation and meet partial retention. Harvest will maintain a moderate amount of retention through the unit, which will reduce fragmentation. Maintain stilted root trees of any species, snags, trees with large branches (greater than 3") for nesting platforms and large diameter trees with heart rot for cavity nesting birds. Harvest activity will mimic natural vegetative patterns such as blowdown or disease pockets. Maintain large wood supply in alluvial fans tributary to resident fish habitat. Minimize sediment transport to Honeymoon Creek.










**PRESCRIPTION DIRECTION:**

The objectives of this unit can best be met by two-aged management. The unit is divided into several sections in order to implement harvest prescriptions in the following manner. Sections A and B will be harvested by individual tree selection which will retain 50% of the basal area over these sections. Section C will be harvested by overstory removal while retaining 30 % of the basal area. Retention should be as windfirm as possible, particularly along streams. Regeneration of harvested areas will be naturally seeded by adjacent trees and seed trees. Future stand treatments may involve limited thinning or sanitation to favor spruce, or cedar and growth of trees with good form for timber. These treatments will also seek to maintain 10-15% of the trees as future snags and large trees for structural diversity. In order to achieve this, some areas within the unit may be left untreated. Harvesting this unit by helicopter and retaining 30- 50 % of the basal area through the unit is expected to have minor effects to the forested wetland acres within this unit. Maintain 100' buffer along class II streams. Take particular care not to disturb existing downwood on 'b' streams. Helicopter yarding is needed to meet this objective. Protection of streams is shown on unit map.

# UNIT 9

## Alternatives 1, 3, 4 & 5



- |  |                                |   |                         |
|--|--------------------------------|---|-------------------------|
|  | Proposed Roads                 |  | Proposed cut units      |
|  | Class 1 Streams                |  | Adjacent proposed units |
|  | Class 2 Streams                |  | TTRA Buffers            |
|  | Class 3 Streams                |  | Saltwater and Lakes     |
|   | Eagle Nest Tree                | <b>A</b>  | Section                 |
| <b>E</b>   | Proposed Log Transfer Facility | <b>PR1</b>  | Prescription            |
| <b>a,b,c</b>   | Stream Protection Level        |   |                         |

Scale: 4 inches = 1 mile

King George Timber Sale      Unit Number 10      In Alternative 4, 5

Compartment 156      VCU 462      Total Acres 42      Harvest Acres 30  
Harvest method cabl      Volume Harvested 1256 MBF

**EXISTING CONDITION:**

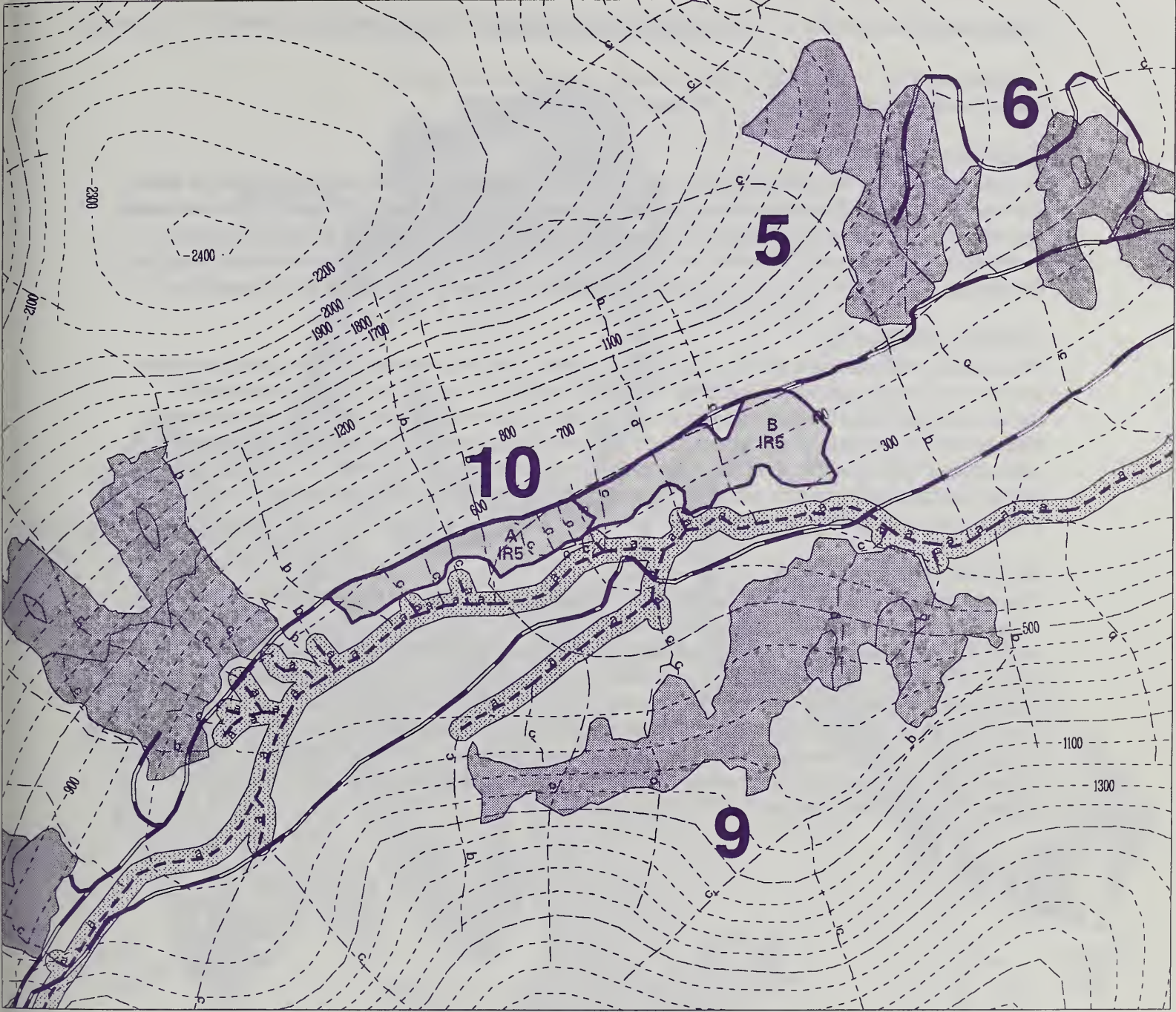
The unit is located in the Honeymoon land unit and is visible Zimovia highway. There is extensive porcupine activity and bole rot within the western hemlock. The unit is located within high deer winter range and high brown creeper and marten habitat. This unit is heavily populated by red squirrels, moose and elk. This unit is contained within a travel corridor for large mammals. There are several class III streams in this unit which are tributary to class II streams.

**DESIRED CONDITION:**

The desired condition of this unit is to harvest timber over a 300 year rotation and meet partial retention. This unit will be managed to produce high quality Sitka spruce lumber and other timber products. Harvest will maintain a moderate amount of retention through the unit, which will reduce fragmentation. Maintain stilted root trees of any species, snags, trees with large branches (greater than 3") for nesting platforms and large diameter trees with heart rot for cavity nesting birds. Harvest activity will mimic natural vegetative patterns such as blowdown or disease pockets. Minimize sediment transport to downstream fish habitat. Maintain a large wood supply to stream channels over the rotation.

**PRESCRIPTION DIRECTION:**

The objectives of this unit can best be met by two-aged or uneven-aged management. The unit will be harvested by individual tree selection and leave 50 % of the basal area as retention. No more than 18 acres of the high volume will be taken on this entry. Retention should be as windfirm as possible, particularly adjacent to streams and stream buffers. Regeneration of harvested areas will be naturally seeded by adjacent trees and seed trees. If a adequate stocking is not achieved by natural regeneration, then Sitka spruce will be planted. Future stand treatments may involve limited thinning, pruning or sanitation to favor spruce and growth of trees with good form for timber. These treatments will also seek to maintain 10-15% of the trees as future snags and large trees for structural diversity. Place a standard 100' buffer along Honeymoon Creek and it's class II tributaries. Class III streams will be protected by streamcourse protection clauses shown on unit card map.



- |       |                                |     |                         |
|-------|--------------------------------|-----|-------------------------|
|       | Proposed Roads                 |     | Proposed cut units      |
|       | Class 1 Streams                |     | Adjacent proposed units |
|       | Class 2 Streams                |     | TTRA Buffers            |
|       | Class 3 Streams                |     | Saltwater and Lakes     |
| ★     | Eagle Nest Tree                | A   | Section                 |
| E     | Proposed Log Transfer Facility | PR1 | Prescription            |
| a,b,c | Stream Protection Level        |     |                         |

Scale: 4 inches = 1 mile

**King George Timber Sale**      Unit Number 10 A (west portion)      In Alternative 3

Compartment 156      VCU 462      Total Acres 16      Harvest Acres 13  
Harvest method cable or shovel      Volume Harvested 482 MBF

**EXISTING CONDITION:**

The unit is located in the Honeymoon land unit. There is extensive porcupine activity and bole rot within the western hemlock. The unit is located within high deer winter range and high brown creeper and marten habitat. This unit is heavily populated by red squirrels, moose and elk. This unit is located in a travel corridor for large mammals. There are four small class III streams in this unit which are tributary to class II fish habitat. The western most stream was recently scoured by a debris flow above the proposed road.

**DESIRED CONDITION:**

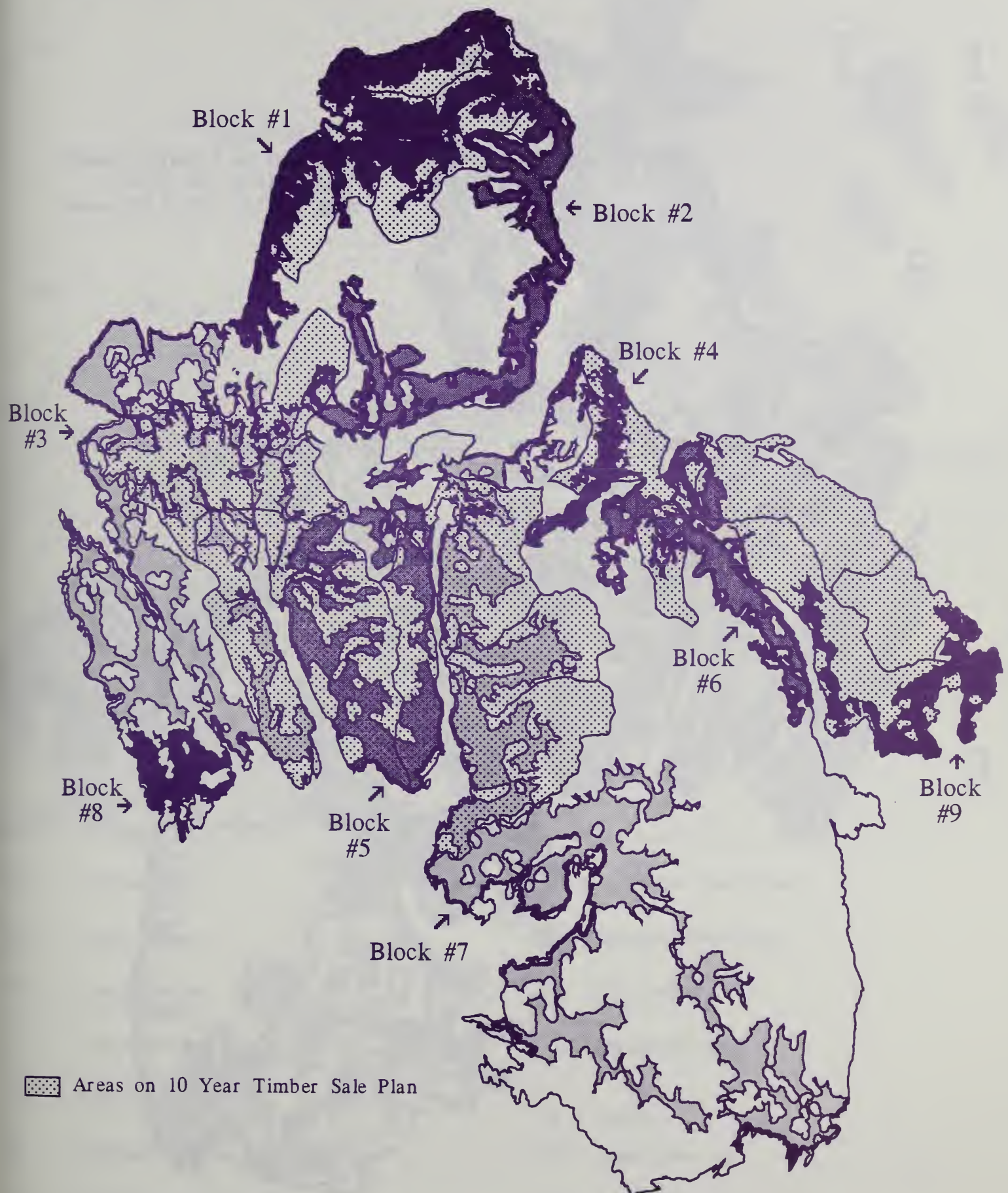
The desired condition of this unit is to harvest timber over a 300 year rotation and meet partial retention. This unit will be managed to produce high quality Sitka spruce for lumber and other timber products. Harvest will maintain a moderate amount of retention through the unit, which will reduce fragmentation. Maintain stilted root trees of any species, snags, trees with large branches (greater than 3") for nesting platforms and large diameter trees with heart rot for cavity nesting birds. Harvest activity will mimic natural vegetative patterns such as blowdown or disease pockets. Minimize sediment transport into Honeymoon Creek and it's tributaries.

**PRESCRIPTION DIRECTION:**

The objectives of this unit can best be met by uneven-aged management. The unit will be harvested by individual tree selection which will leave 30 % of the basal area as retention. Retention should be as windfirm as possible, particularly adjacent to streams. Regeneration of harvested areas will be naturally seeded by adjacent trees and seed trees. If a adequate stocking is not achieved by natural regeneration then Sitka spruce will be planted. Future stand treatments may involve limited thinning, pruning or sanitation to favor spruce and growth of trees with good form for timber. These treatments will also seek to maintain 10-15% of the trees as future snags and large trees for structural diversity. Place a standard 100' buffer along Honeymoon Creek and class II tributaries. Protection of streams is shown of unit map. Utilize full suspension on all class III streams within this unit.

## A - Landscape Analysis and DFC

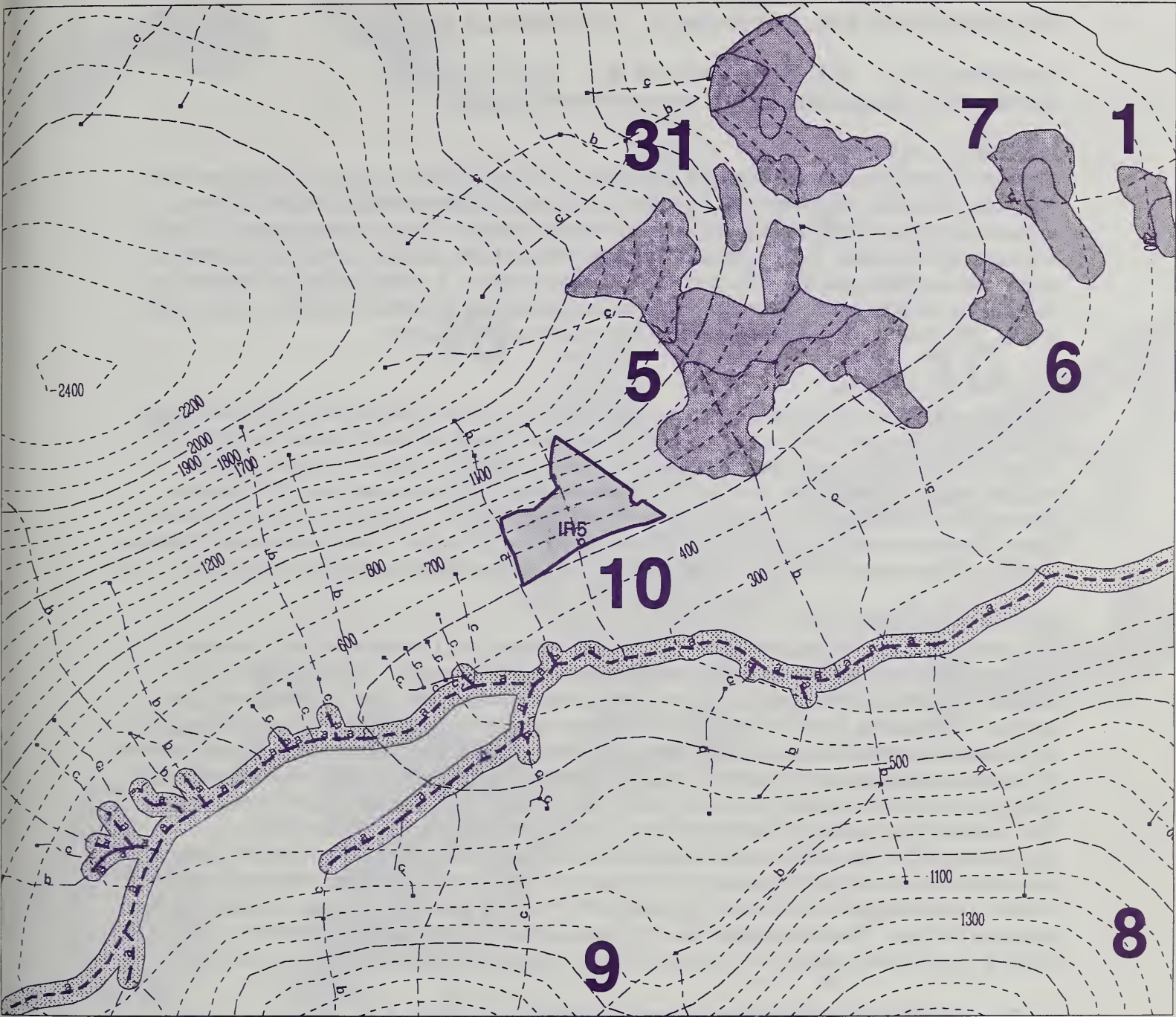
Figure A-3: Existing Old Growth Blocks and 10 Year Action Plan



## A - Landscape Analysis and DFC

Figure A-4: Existing Old Growth Plus Travel and Dispersal Corridors Blocked by Past Timber Harvest





- |       |                                |  |                            |
|-------|--------------------------------|--|----------------------------|
|       | Proposed Roads                 |  | Proposed cut prescriptions |
|       | Class 1 Streams                |  | Adjacent proposed units    |
|       | Class 2 Streams                |  | TTRA Buffers               |
|       | Class 3 Streams                |  | Saltwater and Lakes        |
| ★     | Eagle Nest Tree                |  |                            |
| E     | Proposed Log Transfer Facility |  |                            |
| a,b,c | Stream Protection Level        |  |                            |
- A Section  
PR1 Prescription
- Scale/ 4 inches = 1 mile

**King George Timber Sale    Unit Number 13    In Alternative 2, 3, 4, 5**

Compartment 156    VCU 462    Total Acres 66    Harvest Acres 57  
Harvest method cable & helicopter    Volume Harvested 1511 MBF

**EXISTING CONDITION:**

The unit is visible from Zimovia Strait and Bessie Peak. The unit is located in the Honeymoon land unit. There are several class III streams which are tributary to class II fish habitat within this unit. There is extensive porcupine activity and bole rot within the western hemlock. This unit contains about 52 acres of soil types with moderately high hazard stability rating. This unit also contains 1 acre of mapped forested wetlands located in the southern portion of the unit along the stream. A quarter of this unit is located in high marten, red squirrel and brown creeper habitat and half the unit is located in high deer winter range habitat. The lower portion of this unit contains fairly stable small alluvial fans.

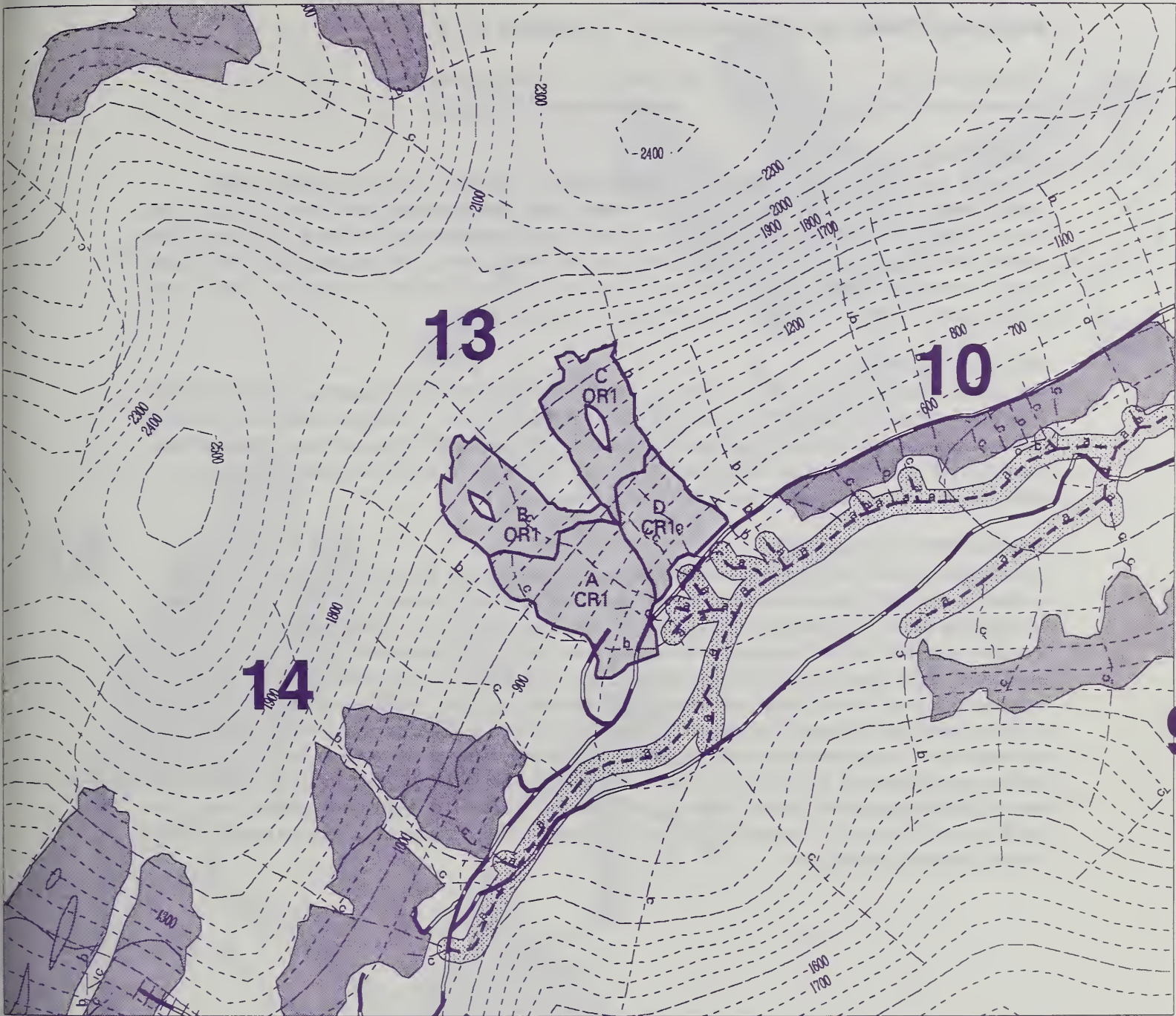
**DESIRED CONDITION:**

The desired condition of this unit is to harvest timber over a 150 year rotation and meet partial retention. Harvest will maintain a light to moderate amount of retention through the unit, which will minimize visual impacts. Harvest activity will mimic the natural vegetative patterns of a landslide or alpine meadow. Maintain stilted root trees of any species, snags, trees with large branches (greater than 3") for nesting platforms and large diameter trees with heart rot for cavity nesting birds. Design the unit up and down the slope to maintain elevational corridor from Honeymoon Creek to the alpine within the landscape. Maintain channel stability through footslope, alluvial fan areas. Minimize sediment transport into Honeymoon Creek.

**PRESCRIPTION DIRECTION:**

The objectives of this unit can best be met by two-aged management. The unit is divided into several sections in order to implement harvest prescriptions in the following manner. Sections A & D will be harvested by cable, while using individual tree selection and retaining 10% of the basal area over these sections. Sections B & C will be harvested by helicopter using individual tree selection and retaining 10% of the basal area within these sections. There will be unharvested triangular islands within this unit in order to enhance the appearance of the unit as a landslide. Retention will include seedtrees of yellow-cedar and Sitka spruce whenever possible. Retention should be as windfirm as possible, particularly along streams. Full suspension and retention of windfirm trees will be used to reduce the risk of slope failure. Regeneration of the unit will be natural seeding by adjacent trees and seed trees. Future stand treatments may involve limited thinning or sanitation to favor spruce, cedar and growth of trees with good form for timber. These treatments will also seek to maintain 10-15% of the trees as future snags and large trees for structural diversity. In order to achieve this, some areas within the unit may be left untreated. Leave existing down material in place on 'b' protect streams. Protection of streams is shown on unit maps.

**NOTE:** Alternative 4 only harvests the western part of this unit (sections A & B).



 Proposed Roads

 Class 1 Streams


 Class 2 Streams


 Class 3 Streams

 Eagle Nest Tree

 Proposed Log Transfer Facility

a,b,c Stream Protection Level

 Proposed cut units

 Adjacent proposed units

 TTRA Buffers

 Saltwater and Lakes

A Section

PR1 Prescription

Scale: 4 inches = 1 mile

**King George Timber Sale**    Unit Number 14    In Alternative 2, 3, 4, 5

Compartment 156    VCU 462    Total Acres 55    Harvest Acres 55  
Harvest method cable & helicopter    Volume Harvested 1369 MBF

**EXISTING CONDITION:**

The unit is seen obliquely from Zimovia Strait and Zimovia Highway. The unit is located in the Honeymoon land unit. There are five class III streams within this unit which are tributary to class II fish habitat. There is extensive porcupine activity and bole rot within the western hemlock. This unit contains about 12 acres of soil types with moderately high hazard stability rating. This unit also contains 20 acres of mapped forested wetlands. The lower portion of this unit is a travel corridor for black bear, deer, elk and moose. About 1/4 of this unit is located in high brown creeper habitat.

**DESIRED CONDITION:**

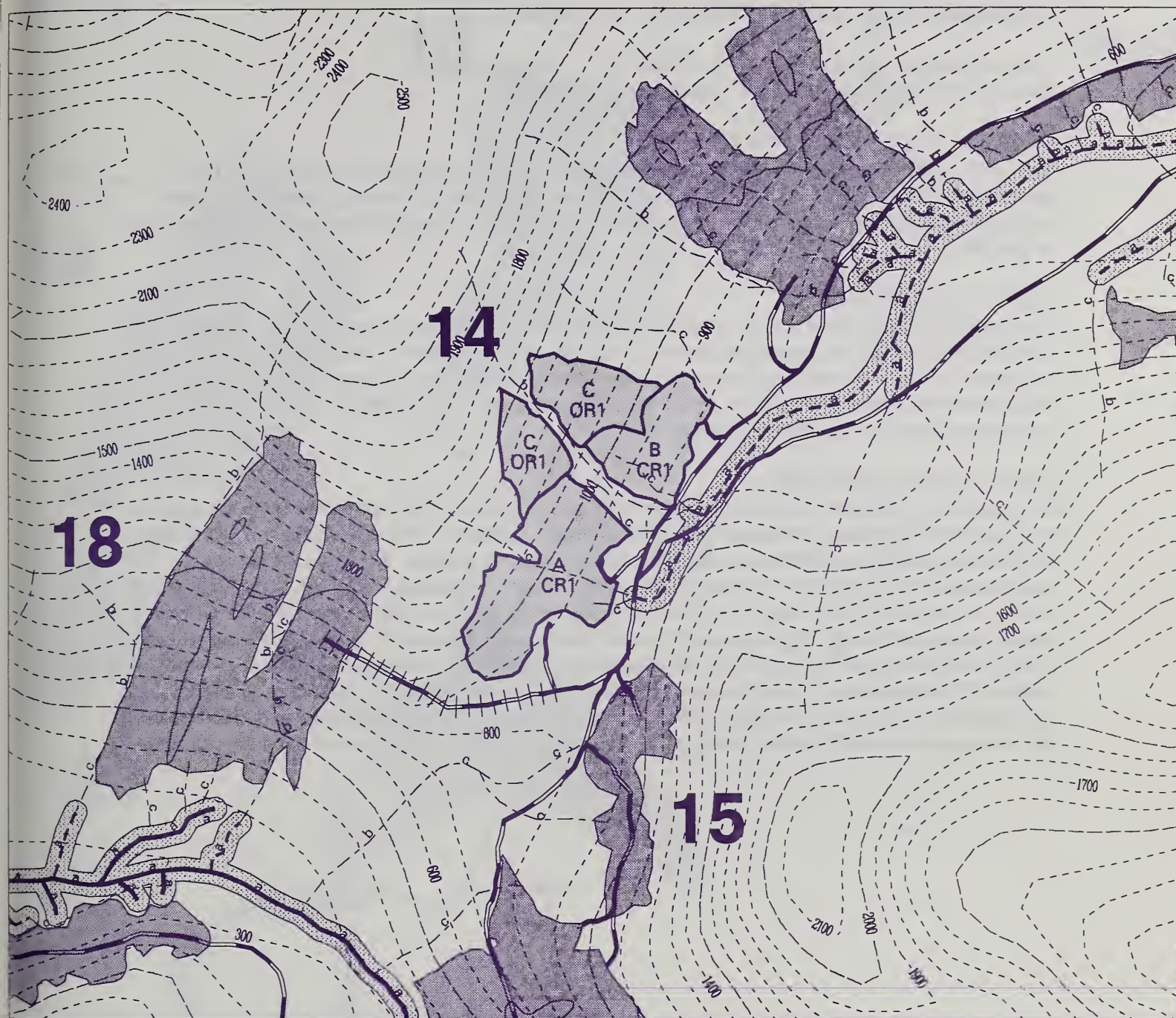
The desired condition of this unit is to harvest timber over a 150 year rotation and meet partial retention. After harvest there will be a light amount of retention through the unit. Maintain stilted root trees of any species, snags, trees with large branches (greater than 3") for nesting platforms and large diameter trees with heart rot for cavity nesting birds. Harvest activity will mimic the natural vegetative pattern of a landslide. Minimize sediment transport into Honeymoon Creek.

**PRESCRIPTION DIRECTION:**

The objectives of this unit can best be met by two-aged management. The unit is divided into several sections in order to implement harvest prescriptions in the following manner. Sections A & B will be harvested by cable, while using individual tree selection and retaining 10% of the basal area over these sections. Section C will be harvested by helicopter using individual tree selection and retaining 10% of the basal area. Full suspension and retaining windfirm trees will reduce the risk of slope failure. Retention will include seedtrees of yellow-cedar and Sitka spruce whenever possible. Retention should be as windfirm as possible, particularly adjacent to streams. Regeneration of the unit will be natural seeding by adjacent trees and seed trees. Future stand treatments may involve limited thinning or sanitation to favor spruce, cedar and growth of trees with good form for timber. These treatments will also seek to maintain 5-10% of the trees as future snags and large trees for structural diversity. Place a 100' buffer along Honeymoon Creek and its class II tributaries. Remove windthrow prone trees from exclusion on 'b' protect stream. Protect streams as shown on unit map.

# UNIT 14

## Alternatives 2, 3, 4 & 5



- |       |                                |     |                         |
|-------|--------------------------------|-----|-------------------------|
|       | Proposed Roads                 |     | Proposed cut units      |
|       | Class 1 Streams                |     | Adjacent proposed units |
|       | Class 2 Streams                |     | TTRA Buffers            |
|       | Class 3 Streams                |     | Saltwater and Lakes     |
| ★     | Eagle Nest Tree                |     |                         |
| E     | Proposed Log Transfer Facility |     |                         |
| a,b,c | Stream Protection Level        |     |                         |
|       |                                | A   | Section                 |
|       |                                | PR1 | Prescription            |

Scale: 4 inches = 1 mile

**King George Timber Sale**   Unit Number 15   In Alternative 2, 3, 4, 5

Compartment 156   VCU 462   Total Acres 14   Harvest Acres 14  
Harvest method cable   Volume Harvested 263 MBF

**EXISTING CONDITION:**

The unit is visible as background from King George estuary and the Alaska Marine Highway. The is located in the Honeymoon land unit. Two class III streams flow through this unit. There is extensive porcupine activity and bole rot within the western hemlock. There is an avalanche shoot (brush field) east of this unit.

**DESIRED CONDITION:**

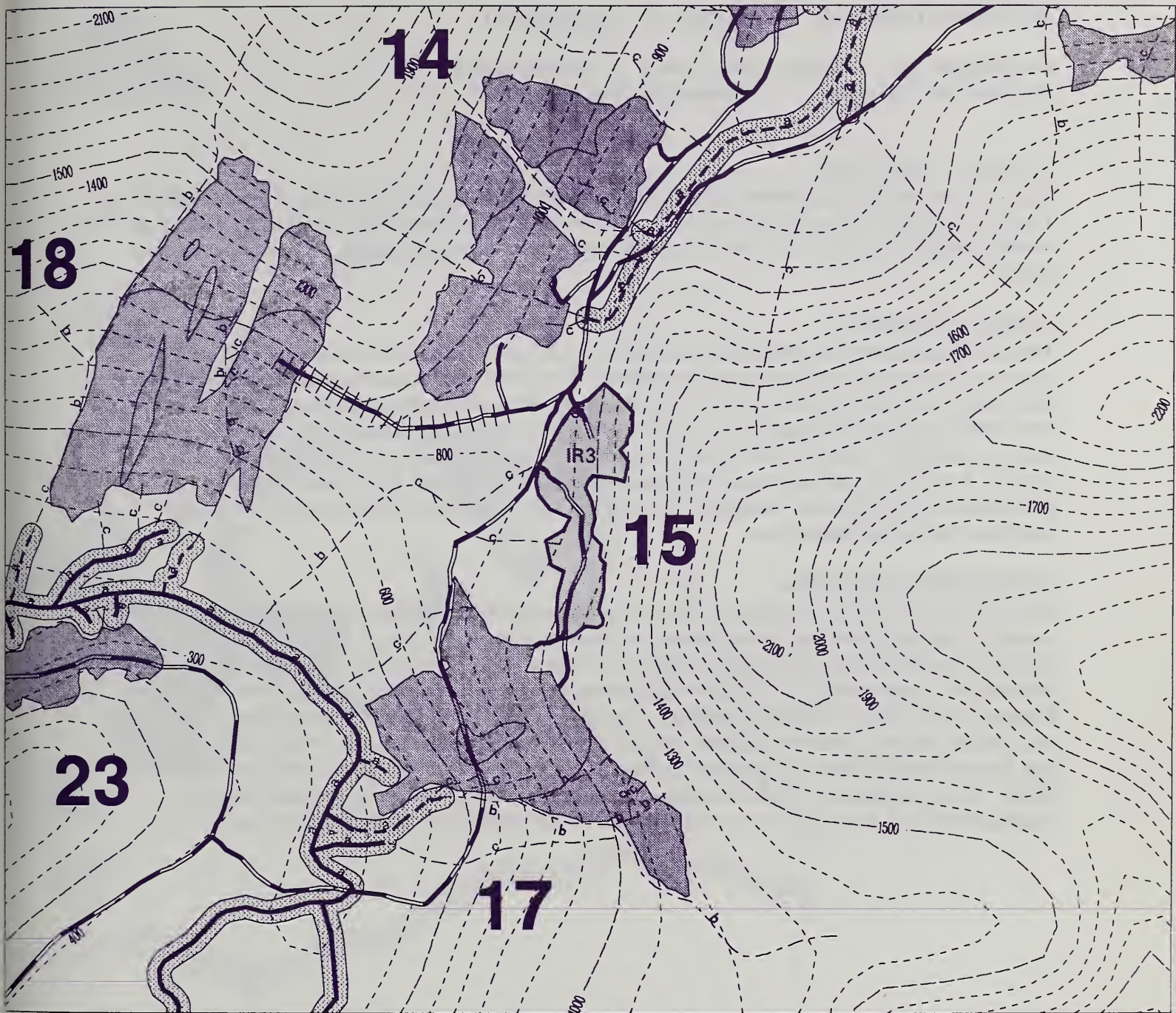
The desired condition of this unit is to harvest timber over a 150 year rotation and meet partial retention. After harvest there will be a moderate amount of retention through the unit. Maintain stilted root trees of any species, snags, trees with large branches (greater than 3") for nesting platforms and large diameter trees with heart rot for cavity nesting birds. Prevent the increase in size of the avalanche shoot. Minimize sediment transport to King George Creek.









**PRESCRIPTION DIRECTION:**

The objectives of this unit can best be met by two-aged management. This unit will be harvested by cable to protect the soil resource. Utilize individual tree selection and retain 30% of the basal area. Retention will include seedtrees of yellow-cedar and Sitka spruce whenever possible. Retention should be as windfirm as possible, particularly along streams. The boundary of this unit will be below the high hazard soils to the east and a buffer along this eastern boundary will help prevent the increase in the size of the brush field above the unit. Regeneration of the unit will be natural seeding by adjacent trees and seed trees. Future stand treatments may involve limited thinning or sanitation to favor spruce, cedar and growth of trees with good form for timber. These treatments will also seek to maintain 5-10% of the trees as future snags and large trees for structural diversity. Close the temporary road into this unit to motorized vehicles after harvest to protect wildlife corridor values to Kunk Lake area. Protect streams as shown on the unit map.

# UNIT 15

# Alternatives 2, 3, 4 & 5



- |  |                                |   |                         |
|--|--------------------------------|---|-------------------------|
|  | Proposed Roads                 |  | Proposed cut units      |
|  | Class 1 Streams                |  | Adjacent proposed units |
|  | Class 2 Streams                |  | TTRA Buffers            |
|  | Class 3 Streams                |  | Saltwater and Lakes     |
| ★  | Eagle Nest Tree                | A   | Section                 |
| E  | Proposed Log Transfer Facility | PR1   | Prescription            |
| a,b,c  | Stream Protection Level        |   |                         |

Scale: 4 inches = 1 mile

King George Timber Sale Unit Number 16 In Alternative 1

Compartment 156 VCU 462 Total Acres 6 Harvest Acres 6  
Harvest method helicopter Volume Harvested 108 MBF

**EXISTING CONDITION:**

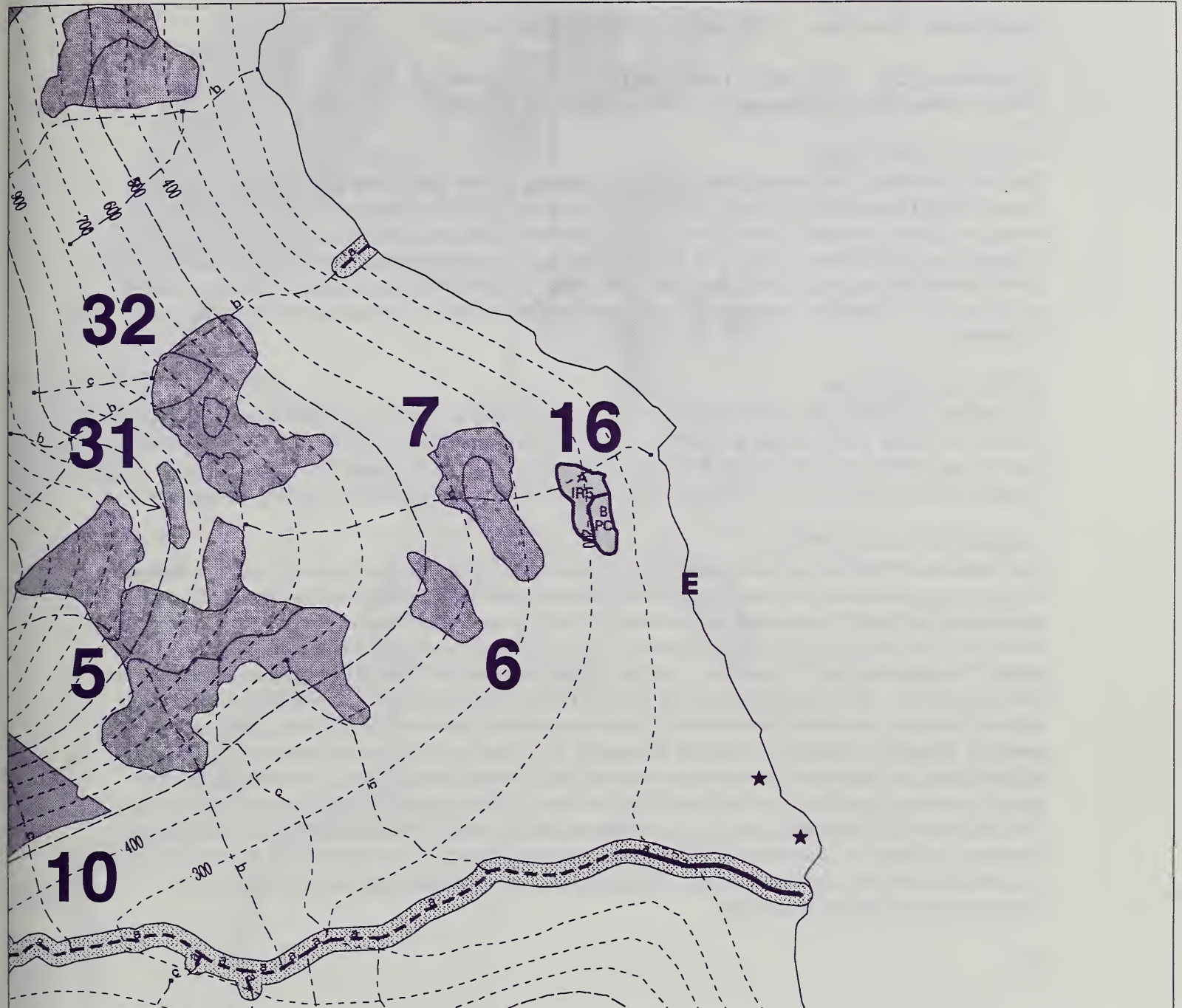
This unit is located in the Honeymoon land unit and is visible from Zimovia Strait and Zimovia highway. There is one class III stream within this unit. There is extensive porcupine activity and bole rot within the western hemlock. This unit is located within high quality deer, black bear, marten, elk and brown creeper habitat.

**DESIRED CONDITION:**

The desired condition of this unit is to harvest timber over a 100 year rotation and meet partial retention. Harvest will maintain a moderate amount of retention through the north western portion of the unit and a slight amount of retention in the south eastern portion. Maintain stilted root trees of any species, snags, trees with large branches (greater than 3") for nesting platforms and large diameter trees with heart rot for cavity nesting birds. Harvest activity will mimic natural vegetative patterns such as blowdown or disease pockets. Recreational and ferry/cruise ship passengers may notice harvest, but it should appear as a natural disturbance dispersed over the landscape. This unit will help reduce some of the visual impact of the backline in the existing harvest unit.

**PRESCRIPTION DIRECTION:**

The objectives of this unit can best be met by two-aged management. The unit is divided into two sections in order to implement harvest prescriptions in the following manner. Sections A will be harvested by individual tree selection which will retain 50% of the basal area over this section. Section B will be harvested by seedtree method. This unit will be perceived as a gradual change over time from travel routes. Retention should be as windfirm as possible, particularly adjacent to the stream. Regeneration of harvested areas will be naturally seeded by adjacent trees and seed trees from within the unit. Future stand treatments may involve limited thinning or sanitation to favor spruce, cedar and growth of trees with good form for timber. These treatments will seek to maintain 5-10% of the trees as future snags and large trees for structural diversity. Streamcourse protection clause 'c' will be applied to the stream in this unit.



- |  |                                |  |                            |
|--|--------------------------------|--|----------------------------|
|  | Proposed Roads                 |  | Proposed cut prescriptions |
|  | Class 1 Streams                |  | Adjacent proposed units    |
|  | Class 2 Streams                |  | TTRA Buffers               |
|  | Class 3 Streams                |  | Saltwater and Lakes        |
|  | Eagle Nest Tree                |  | Section                    |
|  | Proposed Log Transfer Facility |  | Prescription               |

a,b,c Stream Protection Level

Scale/ 4 inches = 1 mile

**King George Timber Sale**    Unit Number 17    In Alternative 2, 3, 5

Compartment 156    VCU 462    Total Acres 60    Harvest Acres 58  
Harvest method cable & helicopter    Volume Harvested 1632 MBF

**EXISTING CONDITION:**

The unit is visible as background from King George estuary and the Alaska Marine Highway. This unit is located in the Honeymoon land unit. There are several class III streams within and bordering this unit which are tributary to class I fish habitat. There is extensive windthrow, porcupine activity and bole rot within the western hemlock. The unit is located within high deer winter range habitat and high quality brown creeper and marten habitat. This unit also contains 17 acres of mapped forested wetlands. There is an alluvial fan - floodplain complex outside the southwest unit boundary, containing several class I and II tributaries.

**DESIRED CONDITION:**

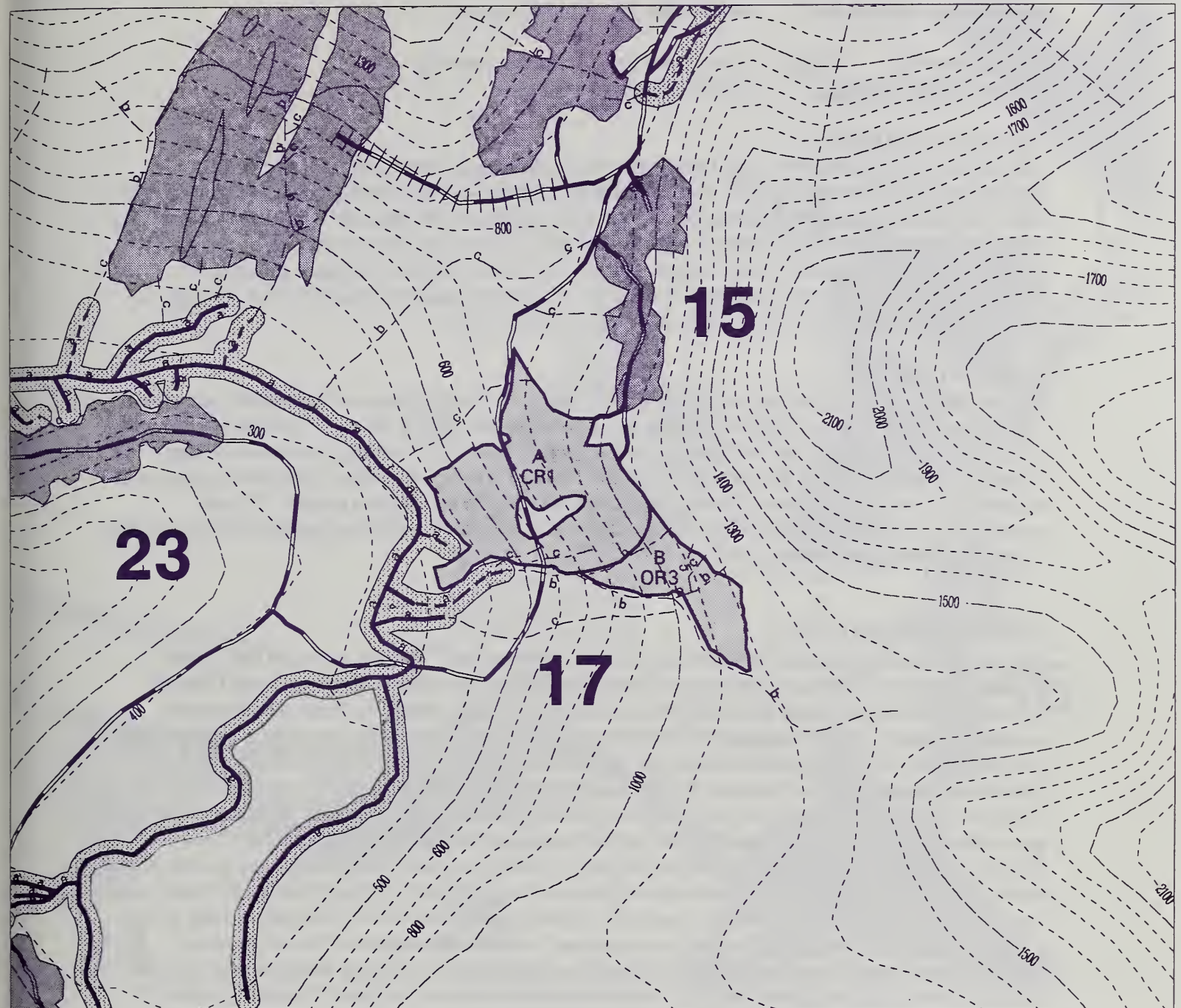
The desired condition of this unit is to harvest timber over a 150 year rotation and meet partial retention. After harvest there will be a light to moderate amount of retention through the unit. Maintain stilted root trees of any species, snags, trees with large branches (greater than 3") for nesting platforms and large diameter trees with heart rot for cavity nesting birds. Minimize sediment transport to King George Creek.

**PRESCRIPTION DIRECTION:**

The objectives of this unit can best be met by two-aged management. The unit is divided into two sections in order to implement harvest prescriptions in the following manner. Section A will be harvested by cable, while using individual tree selection and retaining 10% of the basal area. Section B will be harvested by helicopter using overstory removal and retaining 30% of the basal area within this section. There will be an island of unharvested timber in section A and the unit boundary will be feathered to enhance appearance by providing texture. The overstory removal in section B should help feather the unit and make it blend better into the horizontal landscape. Retention will include seedtrees of yellow-cedar and Sitka spruce whenever possible. Retention should be as windfirm as possible. Regeneration of the unit will be natural seeding by adjacent trees and seed trees. Future stand treatments may involve limited thinning or sanitation to favor spruce, cedar and growth of trees with good form for timber. These treatments will also seek to maintain 5-10% of the trees as future snags and large trees for structural diversity. Maintain 100' buffer between unit boundary and class I or II streams. Remove windthrow prone trees near and upstream for the road along the 'b' protect stream that is south of this unit. Exclude alluvial fan and floodplain landforms from unit. Protect streams as shown on unit map.

# UNIT 17

# Alternatives 2, 3 & 5



Proposed Roads



Class 1 Streams



Class 2 Streams



Class 3 Streams



Eagle Nest Tree



Proposed Log Transfer Facility

a,b,c

Stream Protection Level



Proposed cut units



Adjacent proposed units



TTRA Buffers



Saltwater and Lakes

A

Section

PR1

Prescription

Scale: 4 inches = 1 mile

**King George Timber Sale**      Unit Number 18      In Alternative 5

Compartment 156    VCU 462    Total Acres 101    Harvest Acres 98  
Harvest method helicopter      Volume Harvested 2542 MBF

**EXISTING CONDITION:**

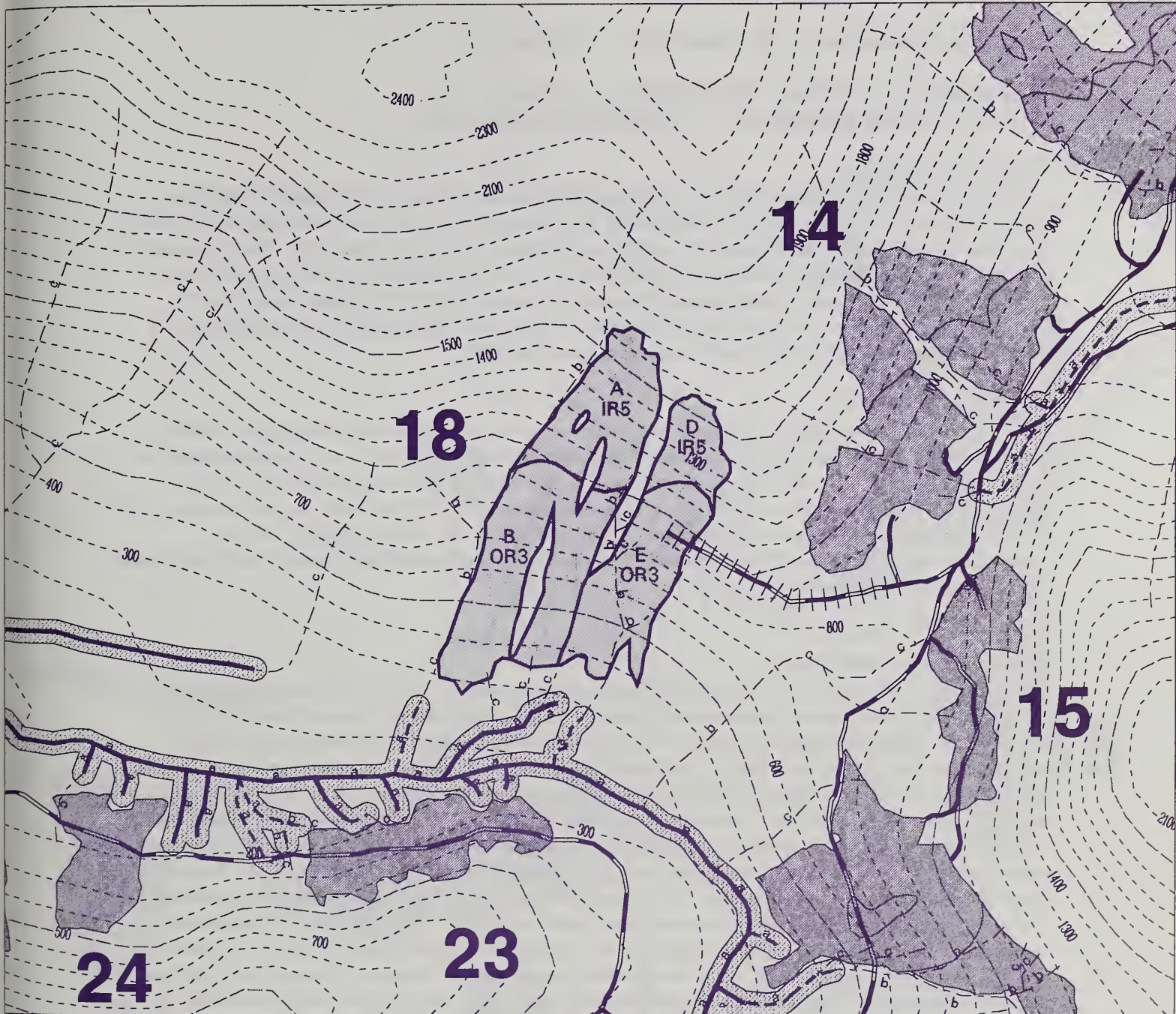
The unit is seen obliquely from King George estuary and from Bessie Peak, and is located in the King George land unit. There are class III streams which are tributary to class I habitat within and bordering this unit. The class III stream that is along the western unit boundary is very large and deep. There is extensive porcupine activity and bole rot within the western hemlock. The unit is located within high deer winter range habitat and high quality brown creeper, goshawk and marten habitat. The upper slopes have somewhat poorly drained soils underlain by basal till. The risk of mass movement for these soil types is high. Slopes are generally 40-65% with some areas exceeding 75%.









**DESIRED CONDITION:**

The desired condition of this unit is to harvest timber over a 150 year rotation and meet partial retention. After harvest there will be a light to moderate amount of retention through the unit. Maintain stilted root trees of any species, snags, trees with large branches (greater than 3") for nesting platforms and large diameter trees with heart rot for cavity nesting birds. Harvest activity will mimic the vegetative patterns of a landslide in the lower portion of this unit and alpine meadows in the northern portion. No road construction in section A and the northern half of section B. Minimize sediment transport into King George Creek. Maintain slope stability.

**PRESCRIPTION DIRECTION:**

The objectives of this unit can best be met by two-aged management. The unit is divided into several sections in order to implement harvest prescriptions in the following manner. Sections A and D will be harvested by helicopter, using individual tree selection and retaining 50% of the basal area over these sections. Section B will be harvested by helicopter using overstory removal and retaining 30% of the basal area. Section E will be harvested by helicopter, while retaining 30 % of the basal area. There will be an island of unharvested timber in section B. The boundary will be feathered to enhance appearance. Retention will include seedtrees of yellow-cedar and Sitka spruce whenever possible. Retention should be as windfirm as possible. Regeneration of the unit will be natural seeding by adjacent trees and seed trees. Future stand treatments may involve limited thinning or sanitation to favor spruce, cedar and growth of trees with good form for timber. These treatments will also seek to maintain 10-30% of the trees as future snags and large trees for structural diversity. Leave 100' buffer along the edge of the floodplain of King George Creek and along all tributaries. The area below the road in section E should have full suspension to minimize disturbance of the steep slopes. Maintain rooting strength by retaining windfirm trees, this will reduce the risk of affecting slope stability. Protect streams as shown on unit map. The lower portion of section B will be designated by the fishery biologist/technician.



- |  |   |
|--|---|
|  Proposed Roads  |  Proposed cut units      |
|  Class 1 Streams |  Adjacent proposed units |
|  Class 2 Streams |  TTRA Buffers            |
|  Class 3 Streams |  Saltwater and Lakes     |
| ★ Eagle Nest Tree  | A Section   |
| E Proposed Log Transfer Facility   | PR1 Prescription  |
| a,b,c Stream Protection Level  |   |

Scale: 4 inches = 1 mile

**King George Timber Sale    Unit Number 18    In Alternative 2**

Compartment 156    VCU 462    Total Acres 101    Harvest Acres 98  
Harvest method cable & helicopter    Volume Harvested 2542 MBF

**EXISTING CONDITION:**

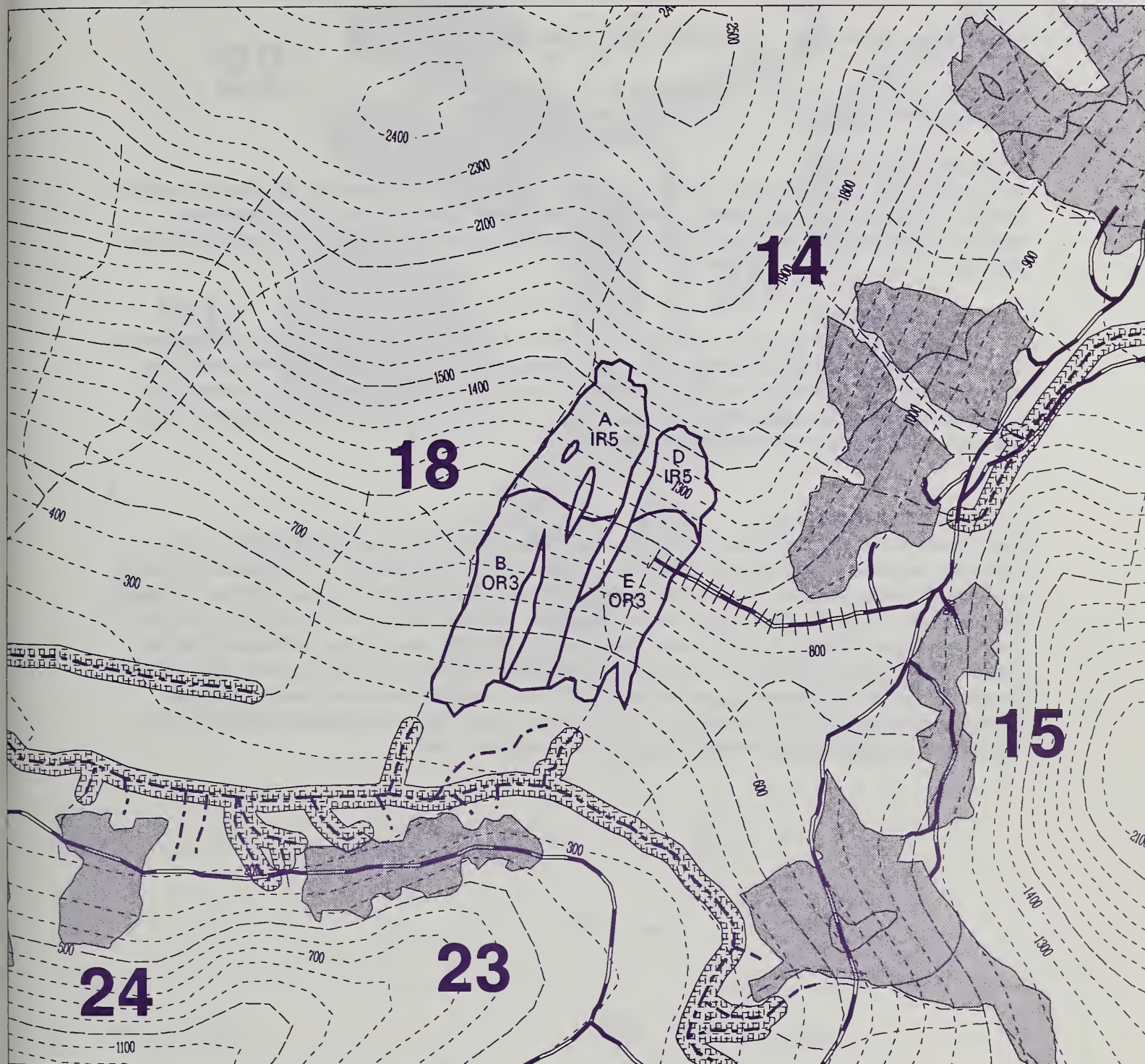
The unit is seen obliquely from King George estuary and from Bessie Peak, and is located in the King George land unit. There are class III streams which are tributary to class I habitat within and bordering this unit. The class III stream that is along the western unit boundary is very large and deep. There is extensive porcupine activity and bole rot within the western hemlock. The unit is located within high deer winter range habitat and high quality brown creeper, goshawk and marten habitat. The upper slopes have somewhat poorly drained soils underlain by basal till. The risk of mass movement for these soil types is high. Slopes are generally 40-65% with some areas exceeding 75%.









**DESIRED CONDITION:**

The desired condition of this unit is to harvest timber over a 150 year rotation and meet partial retention. After harvest there will be a light to moderate amount of retention through the unit. Maintain stilted root trees of any species, snags, trees with large branches (greater than 3") for nesting platforms and large diameter trees with heart rot for cavity nesting birds. Harvest activity will mimic the vegetative patterns of a landslide in the lower portion of this unit and alpine meadows in the northern portion. No road construction in section A and the northern half of section B. Minimize sediment transport into King George Creek. Maintain slope stability.

**PRESCRIPTION DIRECTION:**

The objectives of this unit can best be met by two-aged management. The unit is divided into several sections in order to implement harvest prescriptions in the following manner. Sections A and D will be harvested by helicopter, using individual tree selection and retaining 50% of the basal area over these sections. Section B will be harvested by helicopter using overstory removal and retaining 30% of the basal area. Section E will be harvested by cable (skyline yarding, if suitable anchor trees are available), while retaining 10 % of the basal area. There will be an island of unharvested timber in section B. The boundary will be feathered to enhance appearance. Retention will include seedtrees of yellow-cedar and Sitka spruce whenever possible. Retention should be as windfirm as possible. Regeneration of the unit will be natural seeding by adjacent trees and seed trees. Future stand treatments may involve limited thinning or sanitation to favor spruce, cedar and growth of trees with good form for timber. These treatments will also seek to maintain 10-30% of the trees as future snags and large trees for structural diversity. Leave 100' buffer along the edge of the floodplain of King George Creek and along all tributaries. The area below the road in section E should have full suspension to minimize disturbance of the steep slopes. Maintain rooting strength by retaining windfirm trees, this will reduce the risk of affecting slope stability. Protect streams as shown on unit map. The lower portion of section B will be designated by the fishery biologist/technician.



- |  |                 |   |                         |
|--|-----------------|---|-------------------------|
|  | Proposed Roads  |  | Proposed cut units      |
|  | Class 1 Streams |  | Adjacent proposed units |
|  | Class 2 Streams |  | Saltwater and Lakes     |
|  | Class 3 Streams |  | TTRA Buffers            |

★ Eagle Nest Tree

E Proposed Log Transfer Facility

Scale: 4 inches = 1 mile

A Section  
PR1 Prescription

**King George Timber Sale**   Unit Number 19   In Alternative 2, 3, 5

Compartment 156   VCU 462   Total Acres 36   Harvest Acres 36  
Harvest method helicopter   Volume Harvested 348 MBF

**EXISTING CONDITION:**

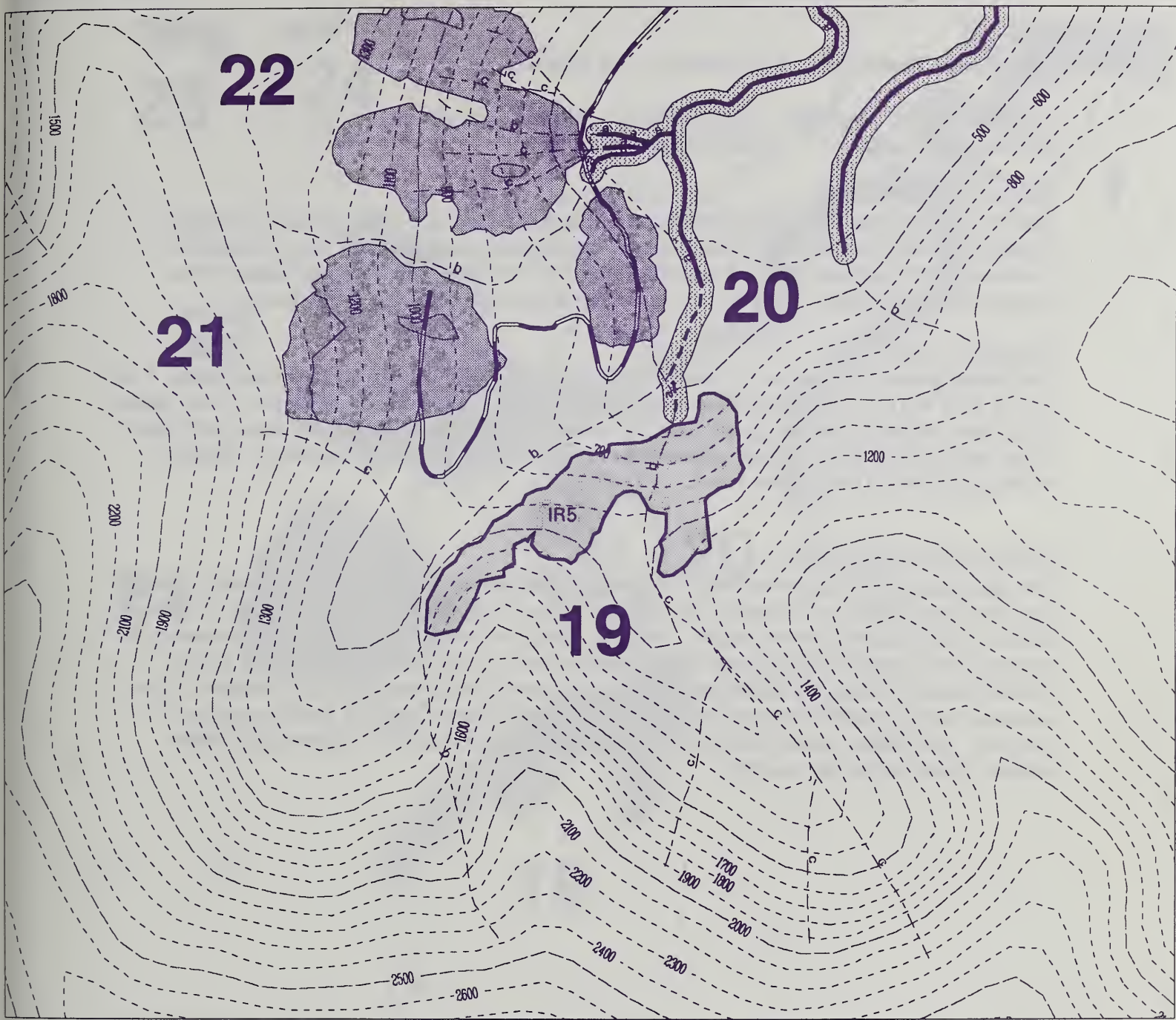
The unit is visible from Bessie Peak and is located in the Bessie land unit. There are two class III streams within and bordering this unit. There is extensive porcupine activity and bole rot within the western hemlock. There are steep slopes on the southwest side of the unit and adjacent to the stream on this side of the unit.














**DESIRED CONDITION:**

The desired condition of this unit is to harvest timber over a 150 year rotation and meet modification. After harvest there will be a moderate amount of retention through the unit. Maintain stilted root trees of any species, snags, trees with large branches (greater than 3") for nesting platforms and large diameter trees with heart rot for cavity nesting birds. Harvest activity will mimic the natural vegetative patterns of alpine. Minimize sediment transport into King George Creek.

**PRESCRIPTION DIRECTION:**

The objectives of this unit can best be met by two-aged management. This unit will be harvested by helicopter, while using individual tree selection and retaining 50% of the basal area. Retention will include seedtrees of yellow-cedar and Sitka spruce whenever possible. Retention should be as windfirm as possible. Regeneration of the unit will be natural seeding by adjacent trees and seed trees. Future stand treatments may involve limited thinning or sanitation to favor spruce, cedar and growth of trees with good form for timber. These treatments will also seek to maintain 10-20% of the trees as future snags and large trees for structural diversity. Helicopter logging and retaining 50 % of the basal area should provide adequate protection to prevent adverse impacts to the soil and water resource by minimizing soil disturbance and maintaining rooting strength. Protect streams as shown on the unit map.



- |  |                                |   |                         |
|--|--------------------------------|---|-------------------------|
|  | Proposed Roads                 |  | Proposed cut units      |
|  | Class 1 Streams                |  | Adjacent proposed units |
|  | Class 2 Streams                |  | TTRA Buffers            |
|  | Class 3 Streams                |  | Saltwater and Lakes     |
|   | Eagle Nest Tree                |  | Section                 |
|   | Proposed Log Transfer Facility |  | Prescription            |
|  | Stream Protection Level        |   |                         |

Scale: 4 inches = 1 mile

**King George Timber Sale**    Unit Number 20    In Alternative 2, 3, 5

Compartment 156    VCU 462    Total Acres 16    Harvest Acres 16  
Harvest method cable    Volume Harvested 570 MBF

**EXISTING CONDITION:**

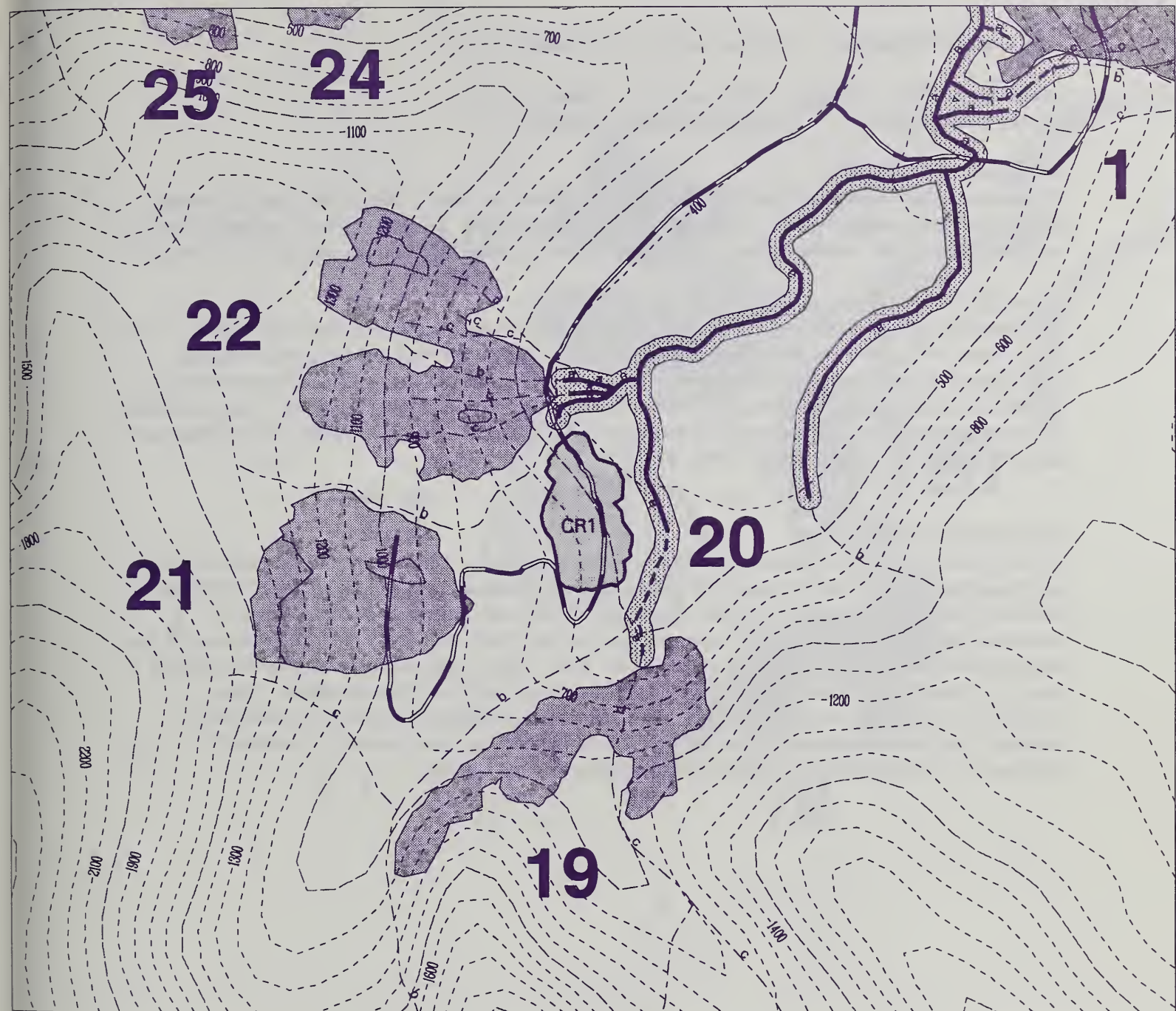
The unit is visible from Bessie Peak and is located in the Bessie land unit. There are not any mapped streams within this unit, although a class II stream approaches the east boundary. There is extensive porcupine activity and bole rot within the western hemlock. The unit is located in high quality brown creeper and marten habitat. There are 6 acres of forested wetlands on the east side of this unit.

**DESIRED CONDITION:**

The desired condition of this unit is to harvest timber over a 150 year rotation and meet modification. After harvest there will be a light amount of retention through the unit. Maintain stilted root trees of any species, snags, trees with large branches (greater than 3") for nesting platforms and large diameter trees with heart rot for cavity nesting birds. Feather unit boundary to help blend the unit into the landscape. Minimize sediment transport to King George Creek.

**PRESCRIPTION DIRECTION:**

The objectives of this unit can best be met by two-aged management. This unit will be harvested by using individual tree selection and retaining 10% of the basal area. Retention will include seedtrees of yellow-cedar and Sitka spruce whenever possible. Retention should be as windfirm as possible. Regeneration of the unit will be natural seeding by adjacent trees and seed trees. Future stand treatments may involve limited thinning or sanitation to favor spruce, cedar and growth of trees with good form for timber. These treatments will also seek to maintain 5-10 % of the trees as future snags and large trees for structural diversity. Uphill cable yarding will minimize disturbance to the wetland soils. Maintain 100' buffer between stream and the unit boundary.



- |   |                                |     |                         |
|---|--------------------------------|-----|-------------------------|
|   | Proposed Roads                 |     | Proposed cut units      |
|   | Class 1 Streams                |     | Adjacent proposed units |
|   | Class 2 Streams                |     | TTRA Buffers            |
|   | Class 3 Streams                |     | Saltwater and Lakes     |
| ★ | Eagle Nest Tree                |     |                         |
| E | Proposed Log Transfer Facility |     |                         |
|   |                                | A   | Section                 |
|   |                                | PR1 | Prescription            |

a,b,c Stream Protection Level

Scale: 4 inches = 1 mile

**King George Timber Sale**   Unit Number 21   In Alternative 2, 3, 5

Compartment 156   VCU 462   Total Acres 37   Harvest Acres 36  
Harvest method cabl   Volume Harvested 541 MBF

**EXISTING CONDITION:**

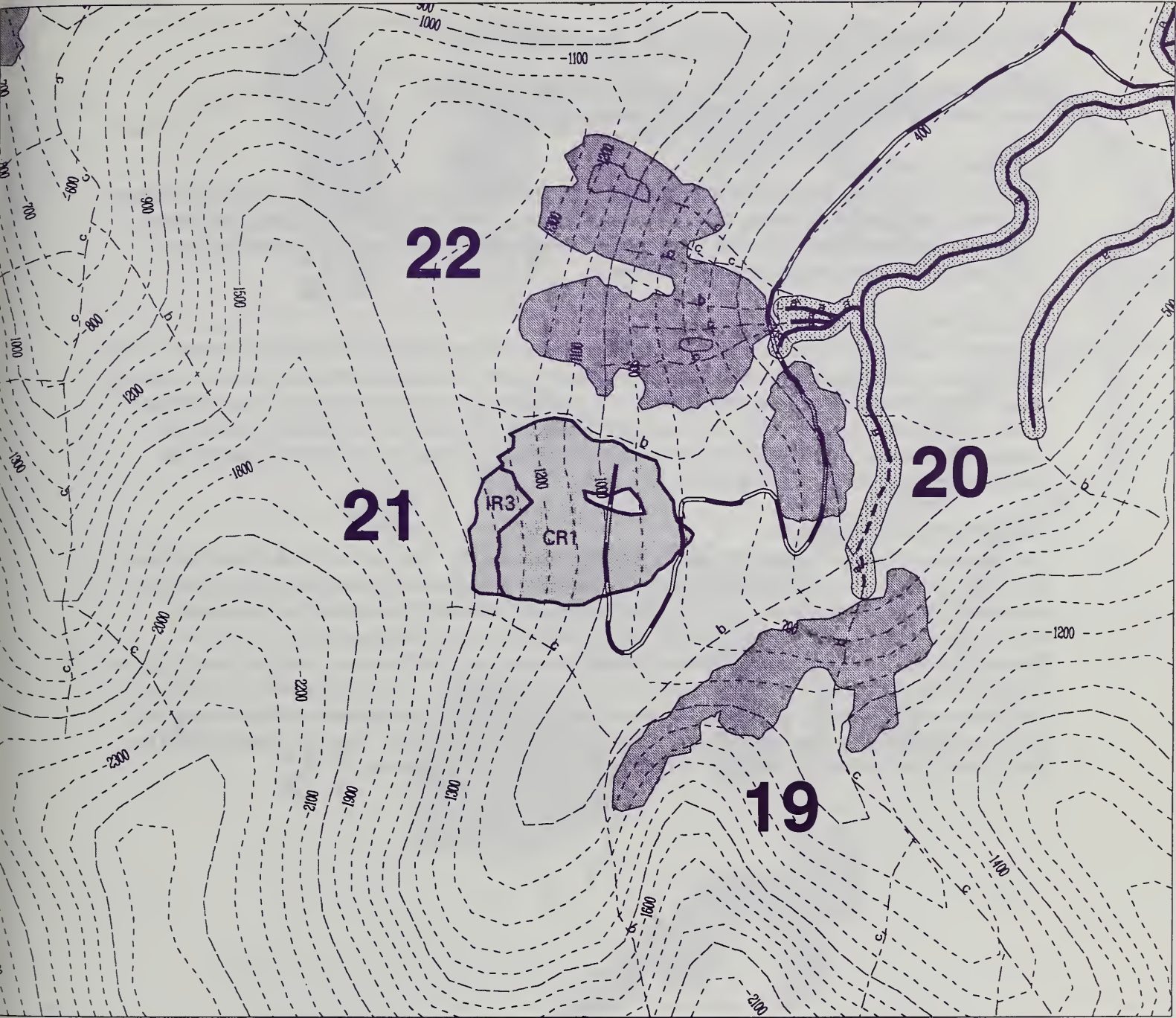
The unit is visible from Bessie Peak and is located in the Bessie land unit. There is one class III stream north of the unit boundary which is a tributary to a class I fish habitat. There is extensive porcupine activity and bole rot within the western hemlock. There are 6 acres of forested wetlands on the east side of this unit.

**DESIRED CONDITION:**

The desired condition of this unit is to harvest timber over a 150 year rotation and meet modification. After harvest there will be 10-15% retention throughout the unit. Maintain stilted root trees of any species, snags, trees with large branches (greater than 3") for nesting platforms and large diameter trees with heart rot for cavity nesting birds. Feather unit boundary to help blend the unit into the landscape. Leave an island of unmanaged timber west of the road to help absorb visual impact of harvest from Bessie Peak. Minimize sediment transport into King George Creek.

**PRESCRIPTION DIRECTION:**

The objectives of this unit can best be met by two-aged management. This unit will be harvested by using individual tree selection and retaining 10% of the basal area. Retention will include seedtrees of yellow-cedar and Sitka spruce whenever possible. Retention should be as windfirm as possible. Remove windthrow prone trees adjacent to the stream north of this unit that is west of the road. Regeneration of the unit will be natural seeding by adjacent trees and seed trees. Future stand treatments may involve limited thinning or sanitation to favor spruce, cedar and growth of trees with good form for timber. These treatments will also seek to maintain 5-10% of the trees as future snags and large trees for structural diversity. Use partial suspension below the road and the southern portion of the unit to minimize disturbance to the wetland soils. Protect streams as shown on the unit map.



- |  |                                |  |                         |
|--|--------------------------------|--|-------------------------|
|  | Proposed Roads                 |  | Proposed cut units      |
|  | Class 1 Streams                |  | Adjacent proposed units |
|  | Class 2 Streams                |  | TTRA Buffers            |
|  | Class 3 Streams                |  | Saltwater and Lakes     |
|  | Eagle Nest Tree                |  |                         |
|  | Proposed Log Transfer Facility |  |                         |
|  | Stream Protection Level        |  |                         |
- 
- |     |              |
|-----|--------------|
| A   | Section      |
| PR1 | Prescription |
- Scale: 4 inches = 1 mile

**King George Timber Sale** Unit Number 22 In Alternative 2, 3, 5

Compartment 156 VCU 462 Total Acres 65 Harvest Acres 61  
Harvest method helicopter Volume Harvested 2106 MBF

**EXISTING CONDITION:**

The unit is visible from Bessie Peak and is located in the Bessie land unit. There are eight class III streams within this unit, which are tributary to class I habitat. There is extensive porcupine activity and bole rot within the western hemlock. This unit contains high brown creeper habitat and high deer winter range. About half of this unit contains high marten habitat.

**DESIRED CONDITION:**

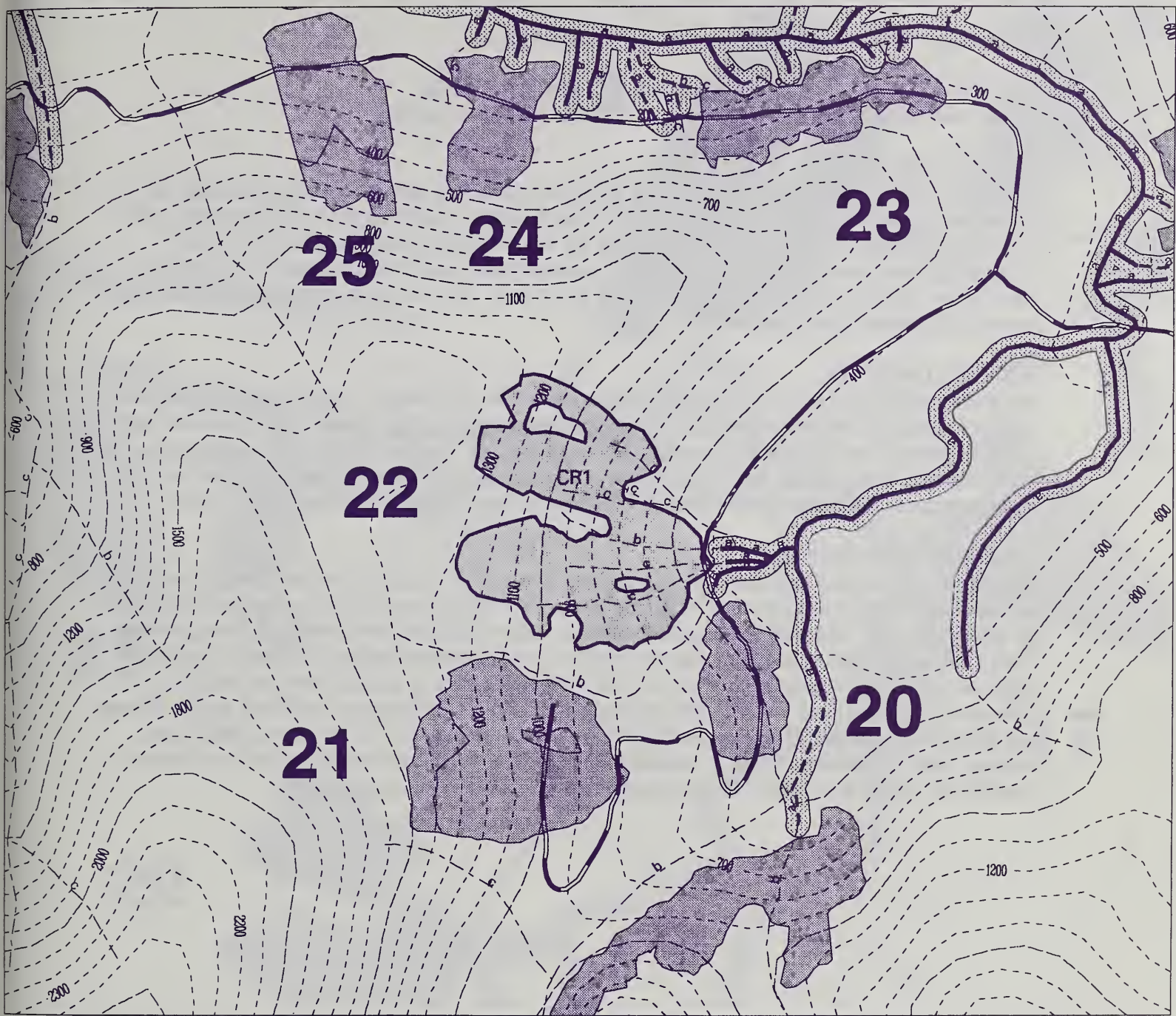
The desired condition of this unit is to harvest timber over a 150 year rotation and meet modification. After harvest there will be a light amount of retention through the unit. Maintain stilted root trees of any species, snags, trees with large branches (greater than 3") for nesting platforms and large diameter trees with heart rot for cavity nesting birds. Feather unit boundary to help blend the unit into the landscape. Leave two islands of unmanaged timber within the unit to help absorb visual impact of harvest from Bessie Peak. Minimize sediment transport into King George Creek.

**PRESCRIPTION DIRECTION:**

The objectives of this unit can best be met by two-aged management. This unit will be harvested by using individual tree selection and retaining 10% of the basal area. Retention will include seedtrees of yellow-cedar and Sitka spruce whenever possible. Retention should be as windfirm as possible, particularly adjacent to streams. Regeneration of the unit will be natural seeding by adjacent trees and seed trees. Future stand treatments may involve limited thinning or sanitation to favor spruce, cedar and growth of trees with good form for timber. These treatments will also seek to maintain 5-10 % of the trees as future snags and large trees for structural diversity. Cut slopes along road should be revegetated with native seed mix before pulling drainage structures. The unit should have feathered edges and leave two islands within the unit to blend the unit into the landscape. Protect streams as shown on unit map.

# UNIT 22

# Alternatives 2, 3 & 5



- |       |                                |  |                         |
|-------|--------------------------------|--|-------------------------|
|       | Proposed Roads                 |  | Proposed cut units      |
|       | Class 1 Streams                |  | Adjacent proposed units |
|       | Class 2 Streams                |  | TTRA Buffers            |
|       | Class 3 Streams                |  | Saltwater and Lakes     |
| ★     | Eagle Nest Tree                |  |                         |
| E     | Proposed Log Transfer Facility |  |                         |
| a,b,c | Stream Protection Level        |  |                         |

A Section  
PR1 Prescription

Scale: 4 inches = 1 mile

King George Timber Sale Unit Number 23 In Alternative 2, 5

Compartment 156 VCU 462 Total Acres 19 Harvest Acres 19  
Harvest method cable with some shovel Volume Harvested 504 MBF

EXISTING CONDITION:

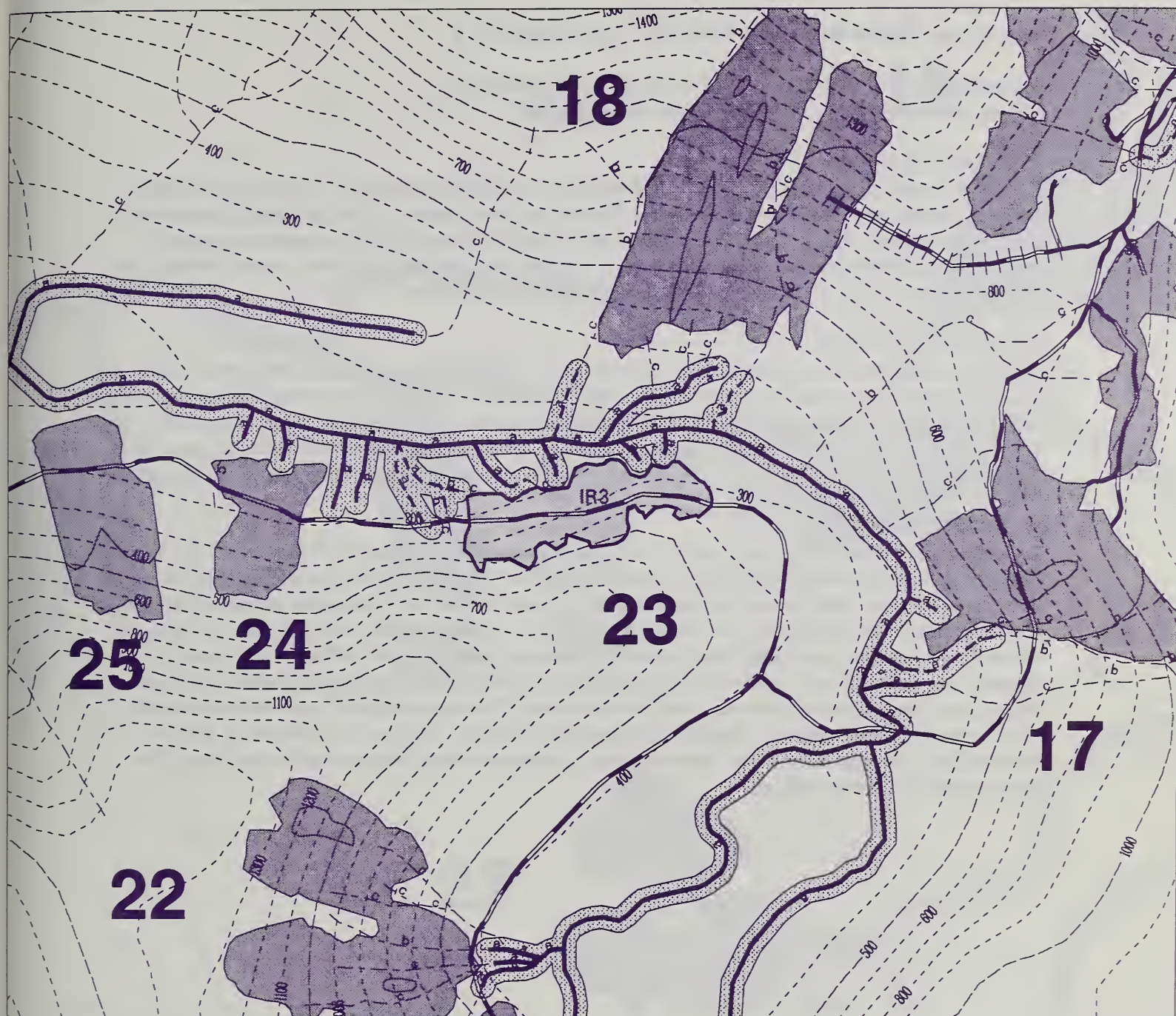
The unit is located in the King George land unit and is not visible from saltwater. There is one class III stream within this unit, which is a tributary to class I and II habitat. King George Creek flows north of this unit. There is extensive porcupine activity and bole rot within the western hemlock. Half of this unit contains high brown creeper habitat. This unit also contains high marten and bear habitat and high deer winter range. There are oversteepened slopes south of this unit. There are slopes within the unit that would prevent the entire unit from being shovel yarded.

DESIRED CONDITION:

The desired condition of this unit is to harvest timber over a 150 year rotation. After harvest there will be a moderate amount of retention in the unit. Maintain stilted root trees of any species, snags, trees with large branches (greater than 3") for nesting platforms and large diameter trees with heart rot for cavity nesting birds. Maintain travel corridor for large mammals. Close this segment of the road post harvest to help reduce impacts on the wildlife travel corridor. Minimize sediment transport into King George Creek.

PRESCRIPTION DIRECTION:

The objectives of this unit can best be met by two-aged management. This unit will be harvested by using individual tree selection and retaining 30% of the basal area. During layout, avoid oversteepened slopes that are south of the unit. Retention will include seedtrees of yellow-cedar and Sitka spruce whenever possible. Feather the northern unit boundary to maintain windfirmness of the stream buffer. Retention should be as windfirm as possible. Regeneration of the unit will be natural seeding by adjacent trees and seed trees. Future stand treatments may involve limited thinning or sanitation to favor spruce, cedar and growth of trees with good form for timber. These treatments will also seek to maintain 10 % of the trees as future snags and large trees for structural diversity. Exclude floodplain from the unit and ensure that the unit boundary provides 100' buffer along class I and II streams. Protect class III stream as shown.



- |       |                                |     |                         |
|-------|--------------------------------|-----|-------------------------|
|       | Proposed Roads                 |     | Proposed cut units      |
|       | Class 1 Streams                |     | Adjacent proposed units |
|       | Class 2 Streams                |     | TTRA Buffers            |
|       | Class 3 Streams                |     | Saltwater and Lakes     |
| ★     | Eagle Nest Tree                | A   | Section                 |
| E     | Proposed Log Transfer Facility | PR1 | Prescription            |
| a,b,c | Stream Protection Level        |     |                         |

Scale: 4 inches = 1 mile

**King George Timber Sale**   Unit Number 24   In Alternative 2, 5

Compartment 156   VCU 462   Total Acres 17   Harvest Acres 17  
Harvest method cable   Volume Harvested 250 MBF

**EXISTING CONDITION:**

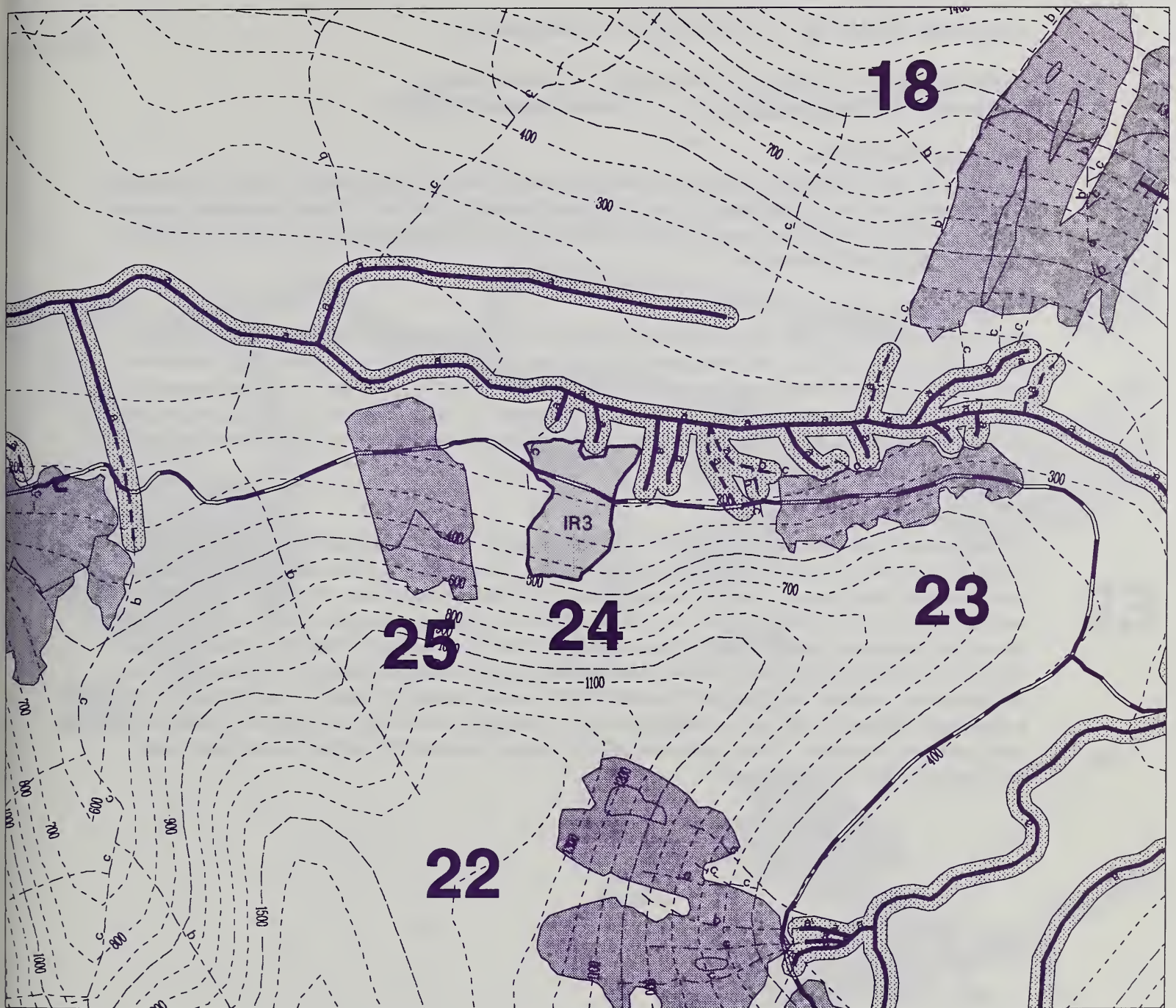
The unit is located in the King George land unit and is not visible from saltwater. The soil is well drained. The unit contains two class III streams which are tributary to class I habitat. There is a class II stream East of the unit boundary. King George Creek floodplain is North of this unit. There is extensive porcupine activity and bole rot within the western hemlock. Half of this unit contains high brown creeper habitat. This unit also contains high marten and bear habitat and high deer winter range.

**DESIRED CONDITION:**

The desired condition of this unit is to harvest timber over a 150 year rotation. After harvest there will be a moderate amount of retention through the unit. Maintain stilted root trees of any species, snags, trees with large branches (greater than 3") for nesting platforms and large diameter trees with heart rot for cavity nesting birds. Maintain travel corridor for large mammals. Close this segment of the road post harvest to help reduce impacts on the wildlife travel corridor. Minimize sediment transport into King George Creek.

**PRESCRIPTION DIRECTION:**

The objectives of this unit can best be met by two-aged management. This unit will be harvested by using individual tree selection and retaining 30% of the basal area. During layout, avoid oversteepened slopes that are south of the unit. Retention will include seedtrees of yellow-cedar and Sitka spruce whenever possible. Feather the northern unit boundary to maintain windfirmness of the floodplain buffer. Retention should be as windfirm as possible, particularly next to streams. Regeneration of the unit will be natural seeding by adjacent trees and seed trees. Future stand treatments may involve limited thinning or sanitation to favor spruce, cedar and growth of trees with good form for timber. These treatments will also seek to maintain 10 % of the trees as future snags and large trees for structural diversity. If the unit is cable yarded, partial suspension will be required to protect the soil surface. Stream protection is shown on the unit map. The unit is suitable for shovel logging.



- |       |                                |     |                         |
|-------|--------------------------------|-----|-------------------------|
|       | Proposed Roads                 |     | Proposed cut units      |
|       | Class 1 Streams                |     | Adjacent proposed units |
|       | Class 2 Streams                |     | TTRA Buffers            |
|       | Class 3 Streams                |     | Saltwater and Lakes     |
| ★     | Eagle Nest Tree                |     |                         |
| E     | Proposed Log Transfer Facility | A   | Section                 |
| a,b,c | Stream Protection Level        | PR1 | Prescription            |

Scale: 4 inches = 1 mile

**King George Timber Sale    Unit Number 25   In Alternative 2,5**

Compartment 156    VCU 462    Total Acres 31    Harvest Acres 31  
Harvest method cable & helicopter    Volume Harvested 712 MBF

**EXISTING CONDITION:**

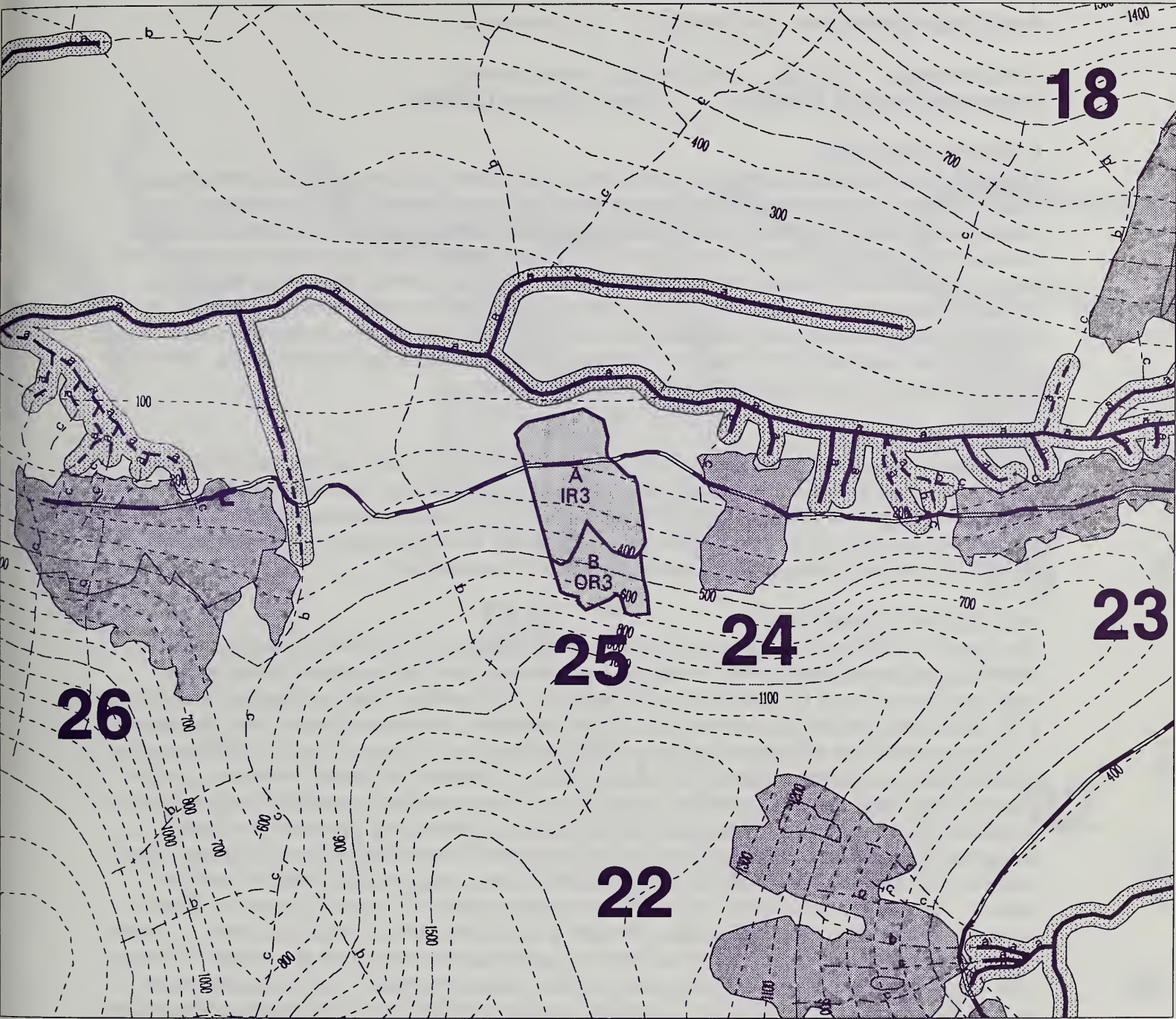
The unit is located in the King George land unit and is visible from King George Bay. There are no mapped streams within this unit. King George Creek floodplain lies north of this unit. There is extensive porcupine activity and bole rot within the western hemlock. Half of this unit contains high brown creeper and marten habitat and high deer winter range.

**DESIRED CONDITION:**

The desired condition of this unit is to harvest timber over a 150 year rotation and meet partial retention. After harvest, there will be a moderate amount of retention through the unit. Maintain stilted root trees of any species, snags, trees with large branches (greater than 3") for nesting platforms and large diameter trees with heart rot for cavity nesting birds. Maintain travel corridor for large mammals. Close this segment of the road post harvest to help reduce impacts on the wildlife travel corridor. Minimize sediment transport into King George Creek.

**PRESCRIPTION DIRECTION:**

The objectives of this unit can best be met by two-aged management. The northern portion of this unit, below the road, can be shovel yarded. Helicopter yard the southern portion of this unit that is beyond the cable reach to reduce visual impact of the backline. The backline should have a 'V' shape to give more of a vertical appearance. Section A of this unit will be harvested by using individual tree selection and retaining 30% of the basal area. Section B will be harvested by overstory removal and retain 30 % of the basal area. Retention will include seedtrees of yellow-cedar and Sitka spruce whenever possible. Retention should be as windfirm as possible. Regeneration of the unit will be natural seeding by adjacent trees and seed trees. Future stand treatments may involve limited thinning or sanitation to favor spruce, cedar and growth of trees with good form for timber. These treatments will also seek to maintain 10 % of the trees as future snags and large trees for structural diversity.



- |       |                                |     |                         |
|-------|--------------------------------|-----|-------------------------|
|       | Proposed Roads                 |     | Proposed cut units      |
|       | Class 1 Streams                |     | Adjacent proposed units |
|       | Class 2 Streams                |     | TTRA Buffers            |
|       | Class 3 Streams                |     | Saltwater and Lakes     |
| ★     | Eagle Nest Tree                | A   | Section                 |
| E     | Proposed Log Transfer Facility | PR1 | Prescription            |
| a,b,c | Stream Protection Level        |     |                         |

Scale: 4 inches = 1 mile

**King George Timber Sale    Unit Number 26    In Alternative 2, 5**

**Compartments 156    VCU 462    Total Acres 61    Harvest Acres 61  
Harvest method cable & helicopter    Volume Harvested 1124 MBF**

**EXISTING CONDITION:**

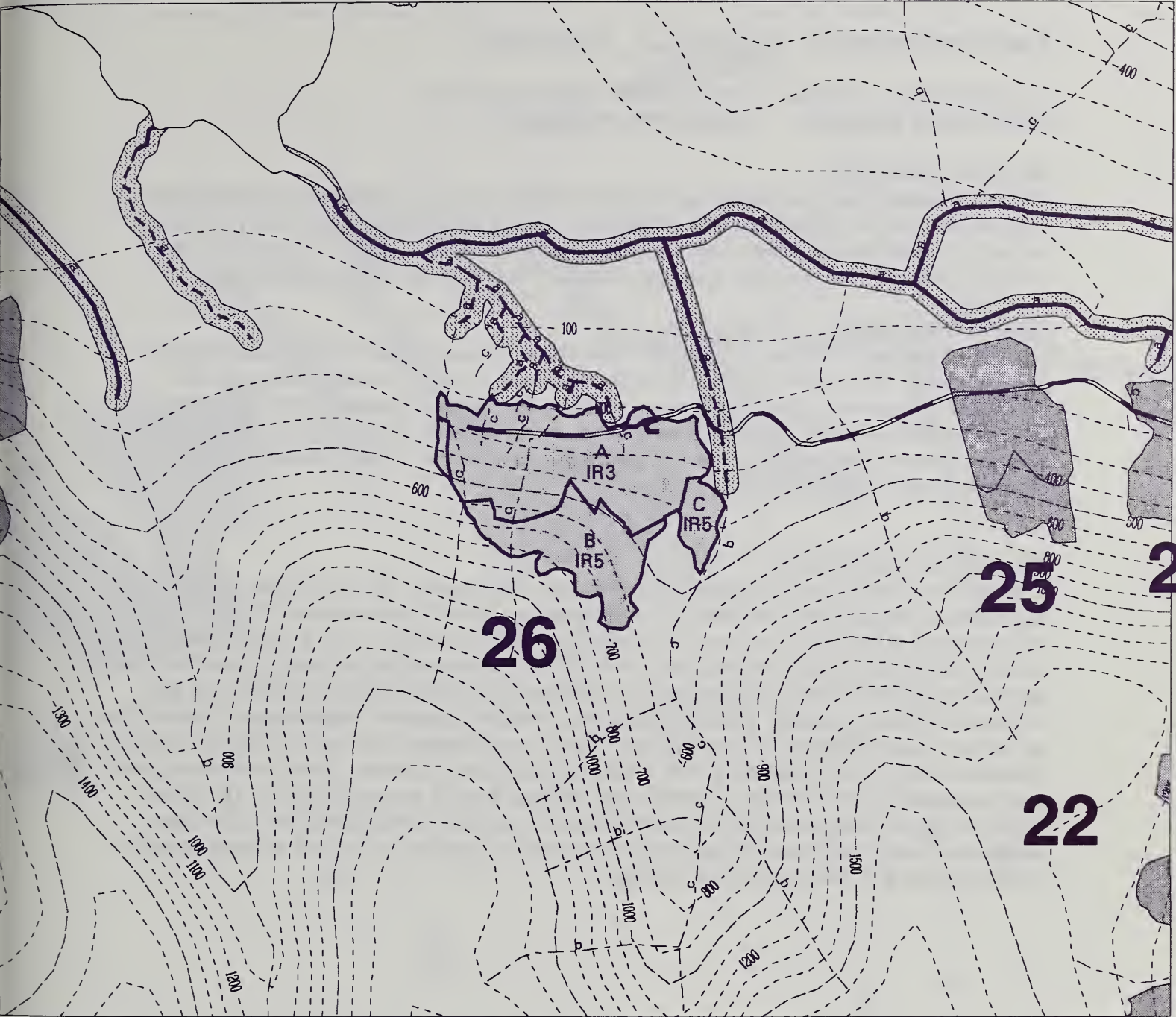
The unit is located in the King George land unit and is visible from King George Bay at an oblique angle. There is extensive porcupine activity and bole rot within the western hemlock. This unit contains five streams in and around this unit. Stream 1 is a class III stream. Stream 2 is a class III stream and contains two other streams in this location as well. Stream 3 is a class II stream up to the northern boundary of this unit and then is a class III stream within the unit. Stream 4 is a class II stream that is along the eastern boundary. Stream 5 is a class III stream that is south of this unit and flows into stream 4. There are 14 acres of forested wetlands along the northern part of this unit. There are 2 acres of high hazard soils along the southwestern part of the unit adjacent to the stream. This unit contains high marten habitat. There is existing scattered blowdown within the helicopter portion of this unit.

**DESIRED CONDITION:**

The desired condition of this unit is to harvest timber over a 150 year rotation and meet partial retention. After harvest there will be a moderate amount of retention through the unit. Maintain stilted root trees of any species, snags, trees with large branches (greater than 3") for nesting platforms and large diameter trees with heart rot for cavity nesting birds. Maintain travel corridor for large mammals. Close this segment of the road post harvest to help reduce impacts on the wildlife travel corridor.

**PRESCRIPTION DIRECTION:**

The objectives of this unit can best be met by two-aged management. The northern portion of this unit, below the road, can be shovel yarded. Extend unit up the slope above cable reach and harvest using helicopter, this will blend the unit better into the landscape. The backline of the unit boundary should utilize a 'V' shaped design to give the unit more of a vertical appearance. Section A of this unit will be harvested by using individual tree selection and retaining 30% of the basal area. Sections B and C will be harvested by individual tree selection and retain 50 % of the basal area. Retention will include seedtrees of yellow-cedar and Sitka spruce whenever possible. Retention should be as windfirm as possible. Regeneration of the unit will be natural seeding by adjacent trees and seed trees. Future stand treatments may involve limited thinning or sanitation to favor spruce, cedar and growth of trees with good form for timber. These treatments will also seek to maintain 10-30% of the trees as future snags and large trees for structural diversity. Streams 1, 2 and 5 will have streamcourse protection clause 'C' applied. Stream 4 will have streamcourse protection clause "A" applied. Stream 3 will have streamcourse protection clause 'C' applied within the unit and streamcourse protection clause 'A' applied to the portion of the stream north of the unit. Yard away from class III streams; if not possible, partially suspend over them. Use full suspension across the high hazard soils if split line yarding is not used. Feather unit boundary and the transition between cable and helicopter.



- Proposed Roads
- Class 1 Streams
- Class 2 Streams
- Class 3 Streams

- ★ Eagle Nest Tree
- E Proposed Log Transfer Facility
- a,b,c Stream Protection Level

- Proposed cut units
- Adjacent proposed units
- TTRA Buffers
- Saltwater and Lakes

- A Section
- PR1 Prescription

Scale: 4 inches = 1 mile

**King George Timber Sale   Unit Number 27   In Alternative 1**

Compartment 156   VCU 462   Total Acres 28   Harvest Acres 28  
Harvest method helicopter   Volume Harvested 366 MBF

**EXISTING CONDITION:**

The unit is located in the King George land unit and is visible from King George Bay, the Alaska Marine Highway route and the trail corridor up to Bessie Peak. There is extensive porcupine activity and bole rot within the western hemlock. There is one class III mapped within this unit. There is 1 acre of forested wetlands within this unit. A quarter of this unit is located within high deer winter range habitat.









**DESIRED CONDITION:**

The desired condition of this unit is to harvest timber over a 150 year rotation and meet partial retention from ferry route. After harvest there will be a moderate to high amount of retention through the unit. Maintain stilted root trees of any species, snags, trees with large branches (greater than 3") for nesting platforms and large diameter trees with heart rot for cavity nesting birds. Maintain travel corridor for large mammals. Recreational and ferry/cruise ship passengers may notice harvest, but it should appear as a natural disturbance dispersed over the landscape.

**PRESCRIPTION DIRECTION:**

The objectives of this unit can best be met by uneven-aged management. The unit is highly visible and a high degree of retention will be necessary to sustain scenic quality due to the steepness of the slope and the close proximity to the viewer. Section A and C of this unit will be harvested by using individual tree selection and retaining 50% of the basal area. Section B will be harvested by group selection and 70 % of the basal area will be retained within this section. Retention will include seedtrees of yellow-cedar and Sitka spruce whenever possible. Retention should be as windfirm as possible. Regeneration of the unit will be natural seeding by adjacent trees and seed trees. Future stand treatments may involve limited thinning or sanitation to favor spruce, cedar and growth of trees with good form for timber. These treatments will also seek to maintain 10-30% of the trees as future snags and large trees for structural diversity. The stream within this unit will have streamcourse protection clause 'C' applied. Harvesting this unit by helicopter yarding and the amount of retention left, will have minimal disturbance to the forested wetlands. Harvest the trail corridor with small groups along the ridge.



- |  |                                |   |                            |
|--|--------------------------------|---|----------------------------|
|  | Proposed Roads                 |  | Proposed cut prescriptions |
|  | Class 1 Streams                |  | Adjacent proposed units    |
|  | Class 2 Streams                |  | TTRA Buffers               |
|  | Class 3 Streams                |  | Saltwater and Lakes        |
| ★  | Eagle Nest Tree                | A   | Section                    |
| E  | Proposed Log Transfer Facility | PR1   | Prescription               |
| a,b,c  | Stream Protection Level        |   |                            |

Scale/ 4 inches = 1 mile

**King George Timber Sale**    Unit Number 28    In Alternative 1, 4, 5

Compartment 156    VCU 462    Total Acres 140    Harvest Acres 140  
Harvest method helicopter    Volume Harvested 2007 MBF

**EXISTING CONDITION:**

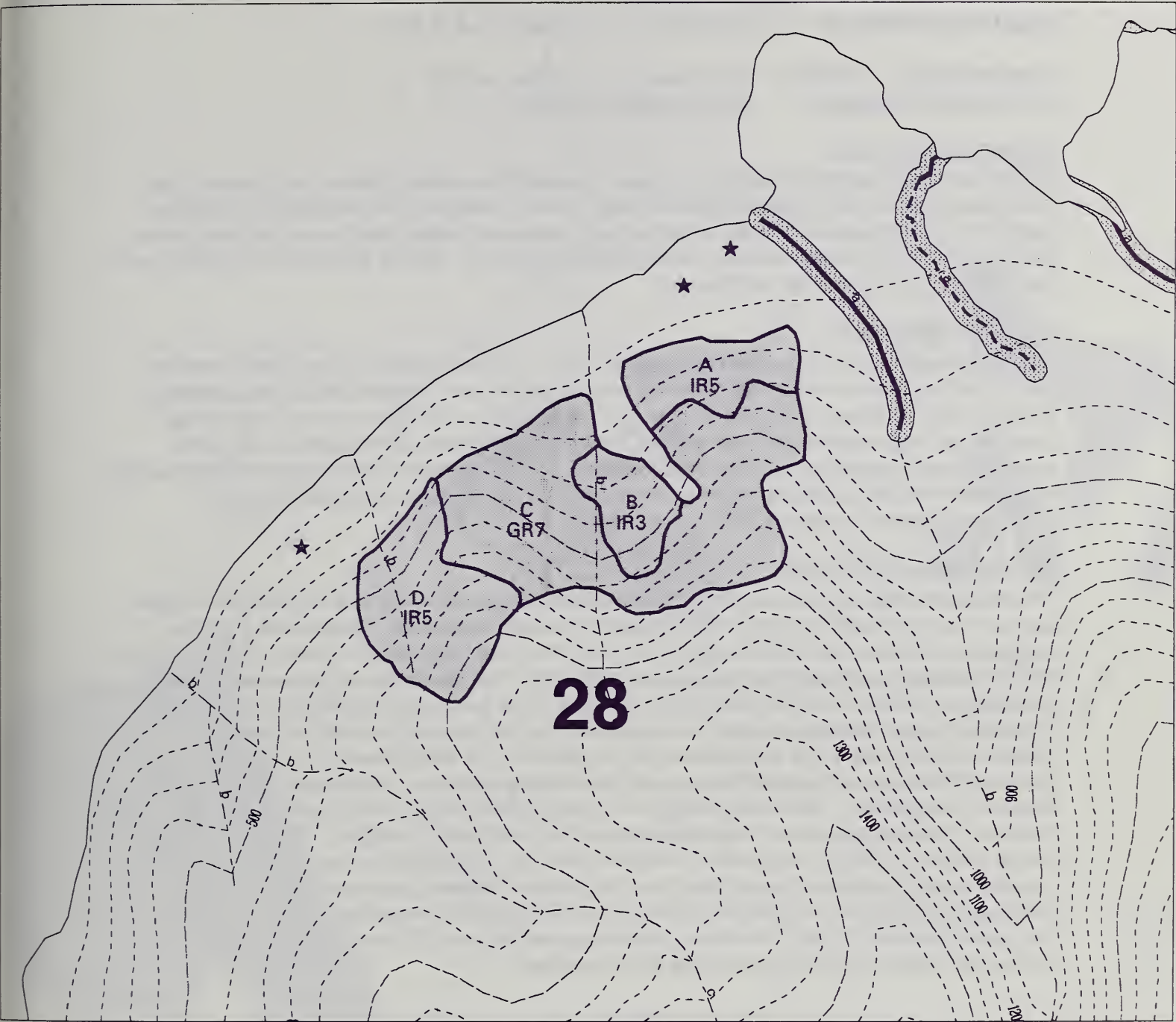
The unit is located in the King George land unit and is visible from Stikine Strait and the Alaska Marine Highway route. There is extensive porcupine activity and bole rot within the western hemlock. There are 10 acres of forested wetlands within this unit. This unit contains high marten habitat. A quarter of the unit is in high deer winter range. There are two class III streams that pass through this unit and one class II stream that is East of the unit. There are three eagle nest sites north of this unit, one to the northwest and two to the northeast. The boundary of this unit is located at least 330 feet from existing eagle nest sites.

**DESIRED CONDITION:**

The desired condition of this unit is to harvest timber over a 150 year rotation and meet partial retention from ferry route. After harvest there will be a moderate to large amount of retention through the unit. Maintain stilted root trees of any species, snags, trees with large branches (greater than 3") for nesting platforms and large diameter trees with heart rot for cavity nesting birds. Maintain travel corridor for large mammals. Recreational and ferry/cruise ship passengers may notice harvest, but it should appear as a natural disturbance dispersed over the landscape.

**PRESCRIPTION DIRECTION:**

The objectives of this unit can best be met by uneven-aged management. The unit is highly visible and a high degree of retention will be necessary for scenic quality due to the steepness of the slope and the close proximity to the viewer. The unit is divided into several sections in order to implement harvest prescriptions in the following manner. Sections A & D will be harvested by individual tree selection while retaining 50% of the basal area over these sections. Section B will be harvested by individual tree selection while retaining 30% of the basal area within this section. Section C will be harvested by group selection and retaining 70% of the basal area within this section. Retention will include seedtrees of yellow-cedar and Sitka spruce whenever possible. Retention should be as windfirm as possible. Regeneration of the unit will be natural seeding by adjacent trees and seed trees. Future stand treatments may involve limited thinning or sanitation to favor spruce, cedar and growth of trees with good form for timber. These treatments will also seek to maintain 10-30% of the trees as future snags and large trees for structural diversity. The two streams within this unit will have streamcourse protection clause 'B' applied. Harvesting this unit by helicopter yarding will have minimal disturbance to the forested wetlands.



Proposed Roads

Class 1 Streams

Class 2 Streams

Class 3 Streams

Eagle Nest Tree

Proposed Log Transfer Facility

Stream Protection Level

Proposed cut units

Adjacent proposed units

TTRA Buffers

Saltwater and Lakes

A Section

PR1 Prescription

Scale: 4 inches = 1 mile

**King George Timber Sale** Unit Number 29 In Alternative 1, 2, 3, 4, 5

Compartment 156 VCU 462 Total Acres 48 Harvest Acres 48  
Harvest method helicopter Harvest volume 788 MBF

**EXISTING CONDITION:**

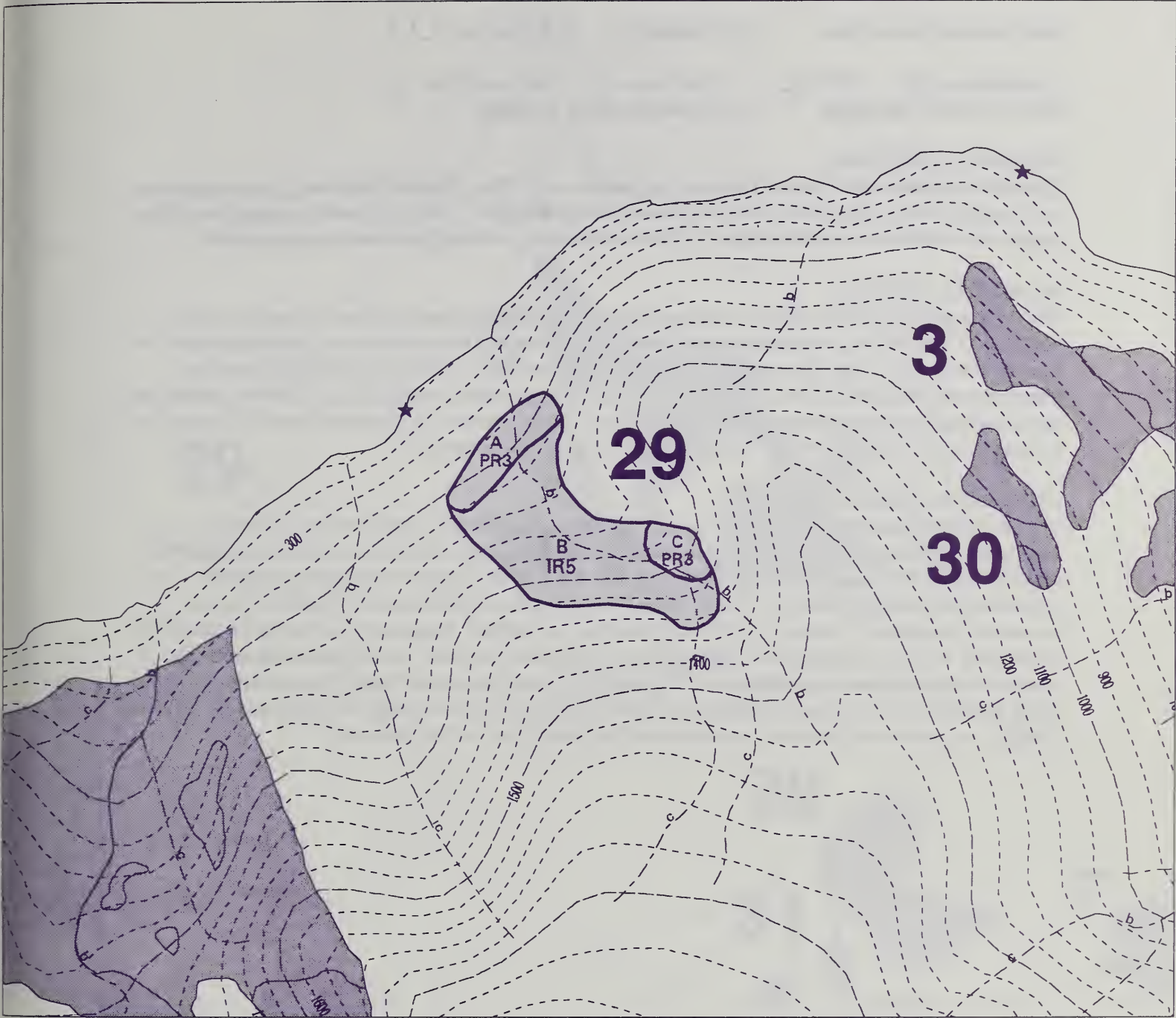
The unit is visible along the Chichagof travel route, located in the eastern portion of the Chichagof land unit. There are two class III streams within this unit. There is extensive porcupine activity and bole rot within the western hemlock. This unit contains about 4 acres of soil types which have a very high hazard stability rating. This unit also contains 8 acres of forested wetlands. The unit is located at least 500' from a eagle nest site Northwest of the unit boundary.










**DESIRED CONDITION:**

The desired condition of this unit is to harvest timber over a 150 year rotation and meet partial retention. Harvest will maintain a moderate amount of retention through the unit, which will reduce fragmentation. Maintain stilted root trees of any species, snags, trees with large branches (greater than 3") for nesting platforms and large diameter trees with heart rot for cavity nesting birds. Harvest activity will mimic natural vegetative patterns such as blowdown or disease pockets. Maintain slope stability and water quality. Recreational and ferry/cruise ship passengers may notice harvest, but it should appear as a natural disturbance dispersed over the landscape.

**PRESCRIPTION DIRECTION:**

The objectives of this unit can best be met by uneven-aged management. The unit is divided into several sections in order to implement harvest prescriptions in the following manner. Sections A & C will be harvested by individual tree selection which will retain 30% of the basal area over these sections. Section B will be harvested by individual tree selection and retain 50% of the basal area over this section. Treatments in section B will use a variety of prescriptions. This unit will be perceived as a gradual change over time from travel routes. Retention should be as windfirm as possible, particularly adjacent to streams. It is not possible to build a road to this unit from the LTF, therefore this unit will be harvested by helicopter. Forested wetlands are not expected to have significant disturbance because of helicopter yarding and the amount of retention left. The 4 acres mapped as very high hazard stability is a depositional area from an old landslide. This slope appears stable and harvest should not contribute to instability. The entire stream length will be protected by streamcourse protection clause "B". Regeneration of harvested areas will be naturally seeded by adjacent trees and seed trees. Future stand treatments may involve limited thinning or sanitation to favor spruce, or cedar and growth of trees with good form for timber. These treatments will also seek to maintain 10-30% of the trees as future snags and large trees for structural diversity. In order to achieve this, some areas within the unit may be left untreated.



- |  |                                |   |                         |
|--|--------------------------------|---|-------------------------|
|  | Proposed Roads                 |  | Proposed cut units      |
|  | Class 1 Streams                |  | Adjacent proposed units |
|  | Class 2 Streams                |  | TTRA Buffers            |
|  | Class 3 Streams                |  | Saltwater and Lakes     |
|   | Eagle Nest Tree                | <b>A</b>  | Section                 |
| <b>E</b>   | Proposed Log Transfer Facility | <b>PR1</b>  | Prescription            |
| <b>a,b,c</b>   | Stream Protection Level        |   |                         |

Scale: 4 inches = 1 mile

**King George Timber Sale**

**Unit Number 30**

**In Alternative 1, 4, 5**

**Compartment 156**

**VCU 462**

**Total Acres 10**

**Harvest Acres 10**

**Harvest method helicopter**

**Volume Harvested 226 MBF**

**EXISTING CONDITION:**

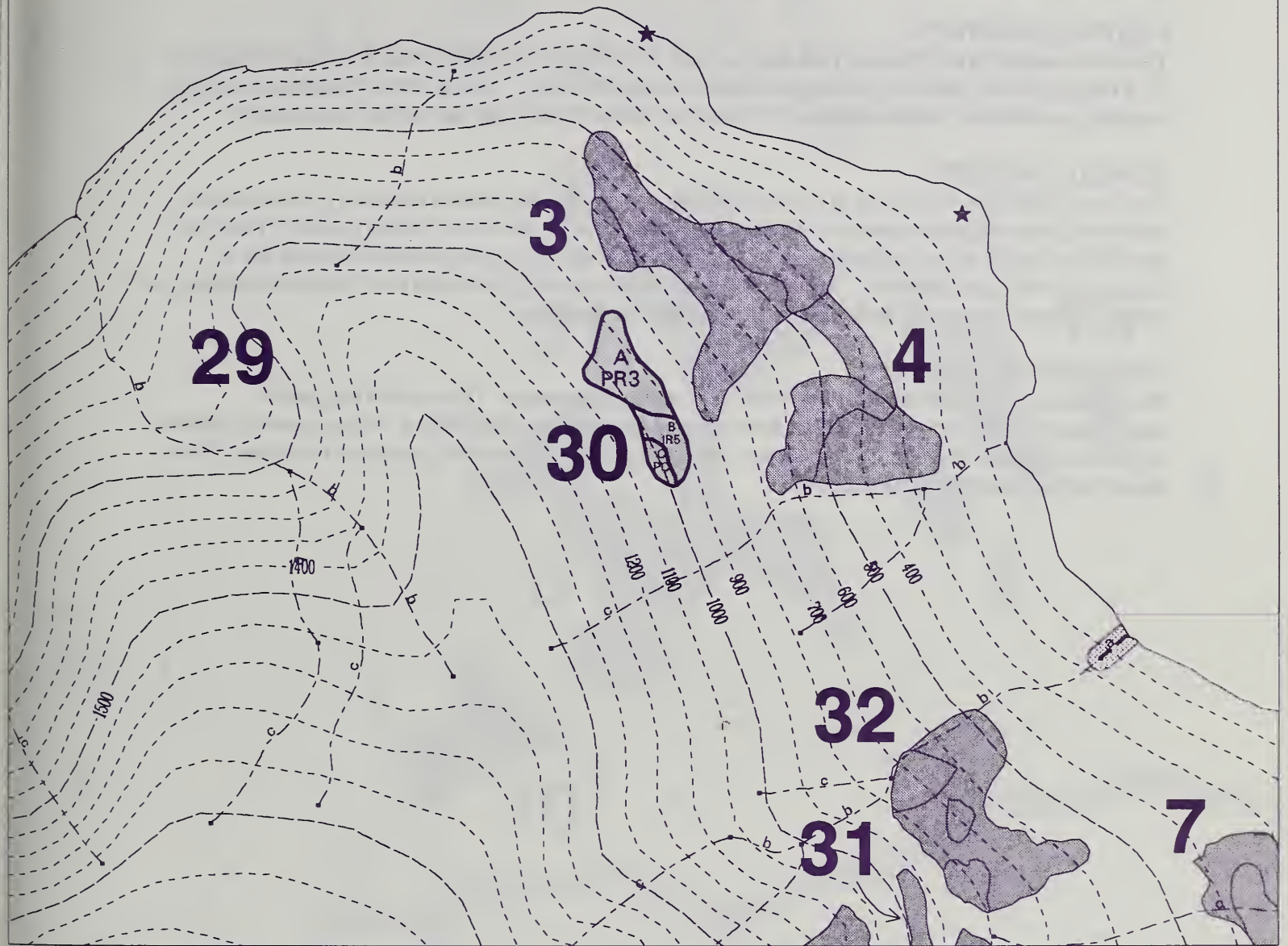
The unit is located in the Zimovia Face land unit and is visible from Zimovia Strait and Zimovia highway on Wrangell Island. There are no mapped streams within this unit. There is extensive porcupine activity and bole rot within the western hemlock. This unit is located within high deer winter range habitat.









**DESIRED CONDITION:**

The desired-condition of this unit is to harvest timber over a 100-150 year rotation and meet partial retention. There will be a moderate amount of retention left in this unit after harvest. Maintain stilted root trees of any species, snags, trees with large branches (greater than 3") for nesting platforms and large diameter trees with heart rot for cavity nesting birds, if the helicopter yarding is used. Harvest activity will mimic natural vegetative patterns such as blowdown or disease pockets. Recreational and ferry/cruise ship passengers may notice harvest, but it should appear as a natural disturbance.

**PRESCRIPTION DIRECTION:**

The unit will be managed as a two-aged stand. The unit is divided into several sections in order to implement harvest prescriptions in the following manner. Section A will be harvested by individual tree selection which will retain 30% of the basal area over this section. Section B will be harvested by individual tree selection which will retain 50% of the basal area over this section. Section C will be harvested by clearcut. Retention should be as windfirm as possible. Regeneration of harvested areas will be naturally seeded by adjacent trees and seed trees from within the unit. Future stand treatments may involve limited thinning or sanitation to favor spruce, cedar and growth of trees with good form for timber. These treatments will also seek to maintain 10-30% of the trees as future snags and large trees for structural diversity. In order to achieve this, some areas within the unit may be left untreated.



- |  |                                |   |                            |
|--|--------------------------------|---|----------------------------|
|  | Proposed Roads                 |  | Proposed cut prescriptions |
|  | Class 1 Streams                |  | Adjacent proposed units    |
|  | Class 2 Streams                |  | TTRA Buffers               |
|  | Class 3 Streams                |  | Saltwater and Lakes        |
| ★  | Eagle Nest Tree                | A   | Section                    |
| E  | Proposed Log Transfer Facility | PR1   | Prescription               |
| a,b,c  | Stream Protection Level        |   |                            |

Scale/ 4 inches = 1 mile

**King George Timber Sale** Unit Number 31 In Alternative 1

Compartment 156 VCU 462 Total Acres 2 Harvest Acres 2  
Harvest method helicopter Volume Harvested 90 MBF

**EXISTING CONDITION:**

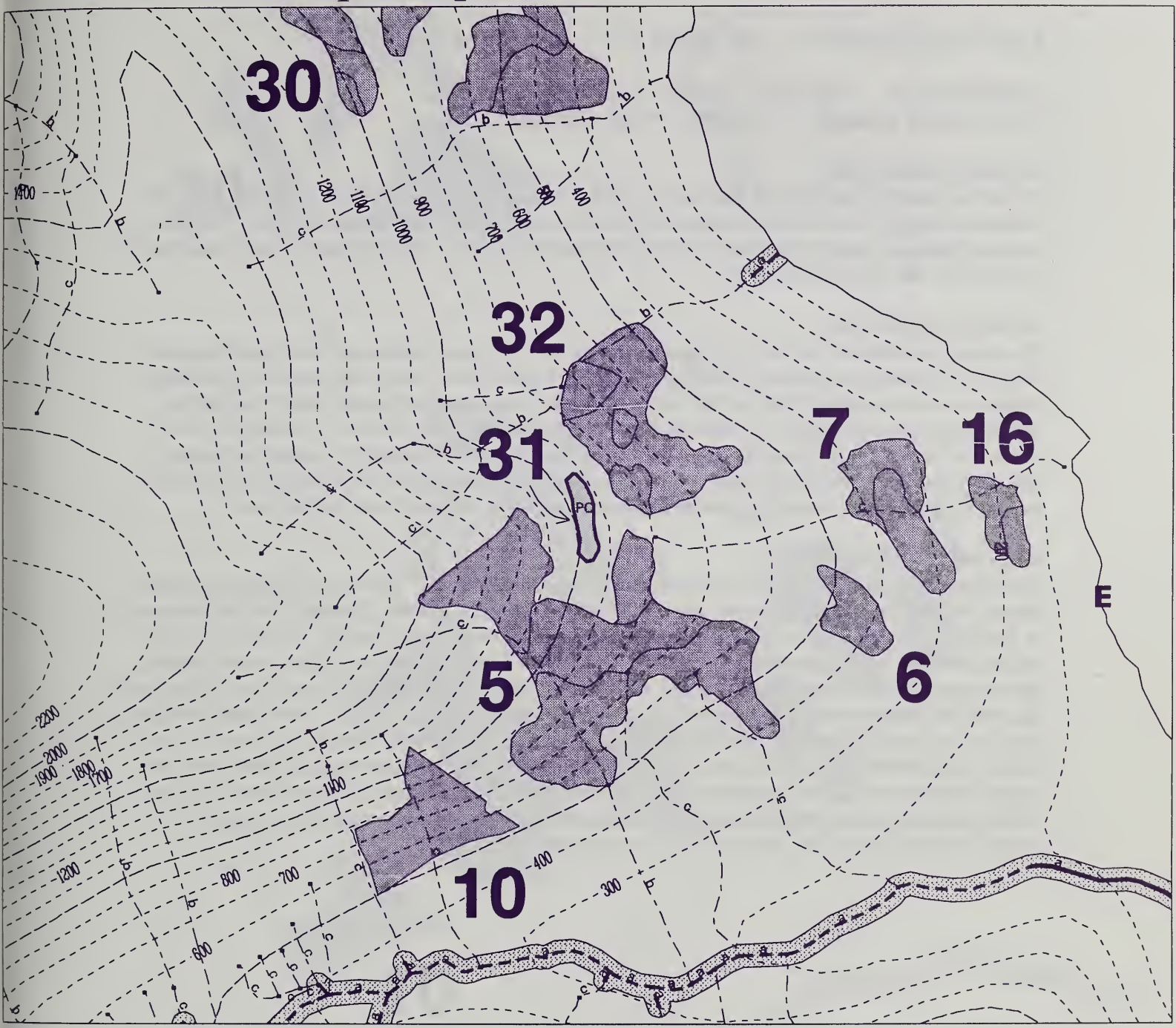
The unit is located in the Zimovia Face land unit and is visible from Zimovia Strait and Zimovia highway on Wrangell Island. There are no mapped streams within this unit. There is extensive porcupine activity and bole rot within the western hemlock. This unit is located within high deer winter range habitat.

**DESIRED CONDITION:**

The desired condition of this unit is to harvest timber over a 100 year rotation and meet partial retention. Harvest activity will mimic natural vegetative patterns, such as blowdown or disease pockets. There may be a texture change in the landscape as seen from Wrangell Island but most of the unit should not be noticeable to the casual observer. Recreational and ferry/cruise ship passengers may notice the opening, but it should appear as a natural disturbance pattern within the landscape.

**PRESCRIPTION DIRECTION:**

The objectives of this unit can best be met by even-aged management. The unit will be clearcut. Regeneration of this unit will be natural from adjacent trees surrounding the unit. Future stand treatments may involve limited thinning to favor spruce, cedar and growth of trees with good form for timber. Unit design will be a contour patch clearcut.



- |              |                                |            |                            |
|--------------|--------------------------------|------------|----------------------------|
|              | Proposed Roads                 |            | Proposed cut prescriptions |
|              | Class 1 Streams                |            | Adjacent proposed units    |
|              | Class 2 Streams                |            | TTRA Buffers               |
|              | Class 3 Streams                |            | Saltwater and Lakes        |
|              | Eagle Nest Tree                | <b>A</b>   | Section                    |
| <b>E</b>     | Proposed Log Transfer Facility | <b>PR1</b> | Prescription               |
| <b>a,b,c</b> | Stream Protection Level        |            |                            |
- Scale/ 4 inches = 1 mile

King George Timber Sale      Unit Number 32      In Alternative 1

Compartment 156    VCU 462    Total Acres 27    Harvest Acres 27  
Harvest method helicopter    Volume Harvested 689 MBF

**EXISTING CONDITION:**

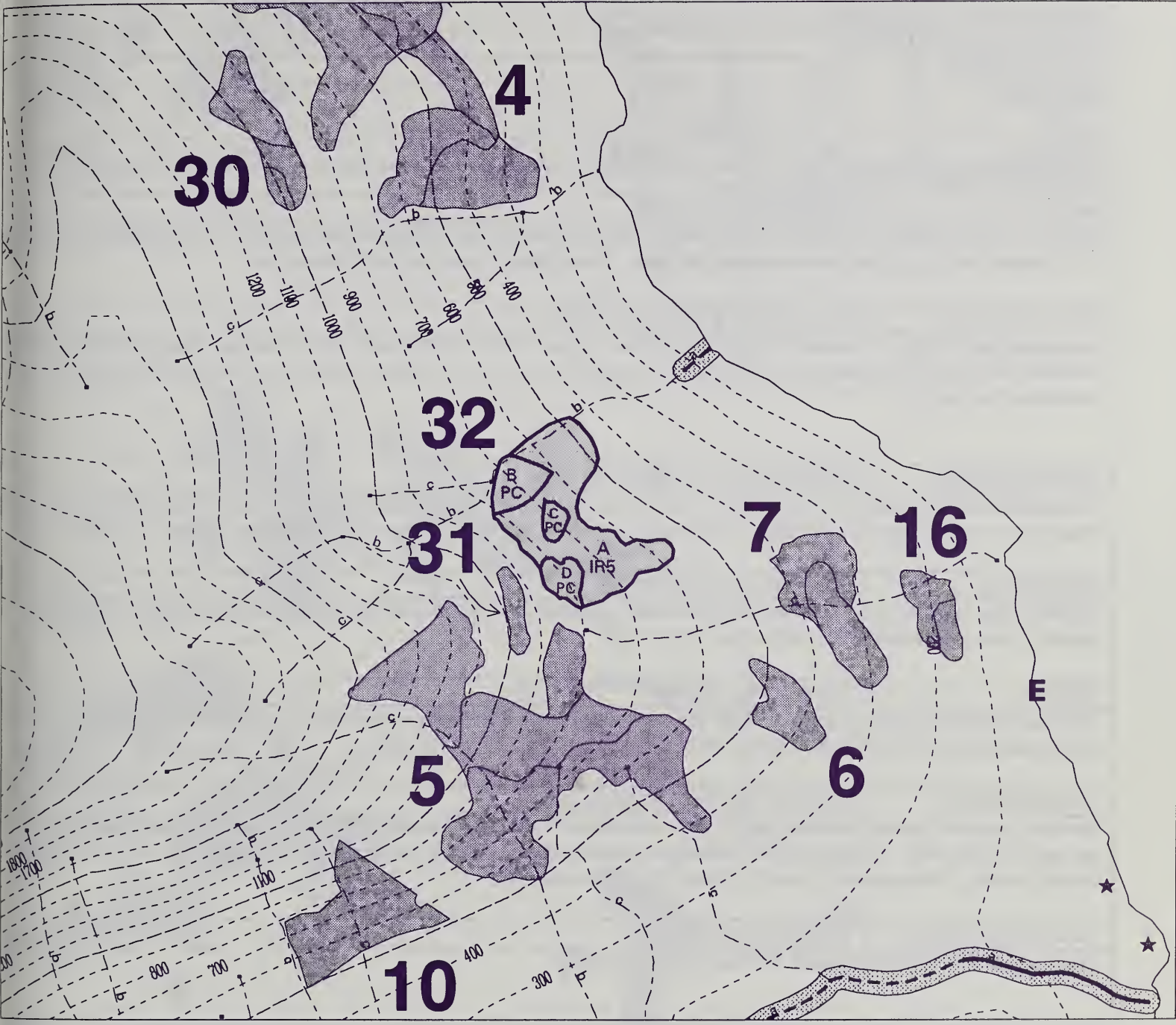
The unit is located in the Zimovia Face land unit and is visible from Zimovia Strait, the Nemo campsites, residences along FH16 and Zimovia highway. There is one mapped stream within this unit. There is extensive porcupine activity and bole rot within the western hemlock. This unit and the area around it gets quite a bit of elk, deer and moose use.

**DESIRED CONDITION:**

The desired condition of this unit is to harvest timber over a 150 year rotation and meet partial retention. Harvest will maintain a moderate amount of retention through the unit, which will reduce fragmentation. Maintain stilted root trees of any species, snags, trees with large branches (greater than 3") for nesting platforms and large diameter trees with heart rot for cavity nesting birds. Maintain structural diversity within unit for wildlife hiding cover. Meet partial retention with harvest activity by mimicking natural vegetative patterns, such as blowdown or disease pockets. Recreational and ferry/cruise ship passengers may notice harvest, but it should appear as a natural disturbance, dispersed over the landscape.

**PRESCRIPTION DIRECTION:**

The objectives of this unit can best be met by uneven-aged management. The unit is divided into several sections in order to implement harvest prescriptions in the following manner. Section A will be harvested by individual tree selection which will retain 50% of the basal area over this section. Sections B, C & D will be harvested by group selection while retaining some seed trees of cedar and spruce, where possible. Retention should be as windfirm as possible, particularly adjacent to the stream. Regeneration of harvested areas will be naturally seeded by adjacent trees and seed trees from within the unit. Future stand treatments may involve limited thinning or sanitation to favor spruce, cedar and growth of trees with good form for timber. These treatments will also seek to maintain 10 % of the trees as future snags and large trees for structural diversity. In order to achieve this, some areas within the unit may be left untreated. Helicopter yarding, varying harvest prescriptions and irregular unit design should achieve partial retention in this highly visible and steep unit. The stream will be protected by clause 'c'.



- |  |                                |  |                            |
|--|--------------------------------|--|----------------------------|
|  | Proposed Roads                 |  | Proposed cut prescriptions |
|  | Class 1 Streams                |  | Adjacent proposed units    |
|  | Class 2 Streams                |  | TTRA Buffers               |
|  | Class 3 Streams                |  | Saltwater and Lakes        |
|  | Eagle Nest Tree                |  |                            |
|  | Proposed Log Transfer Facility |  |                            |

A      Section  
PR1    Prescription

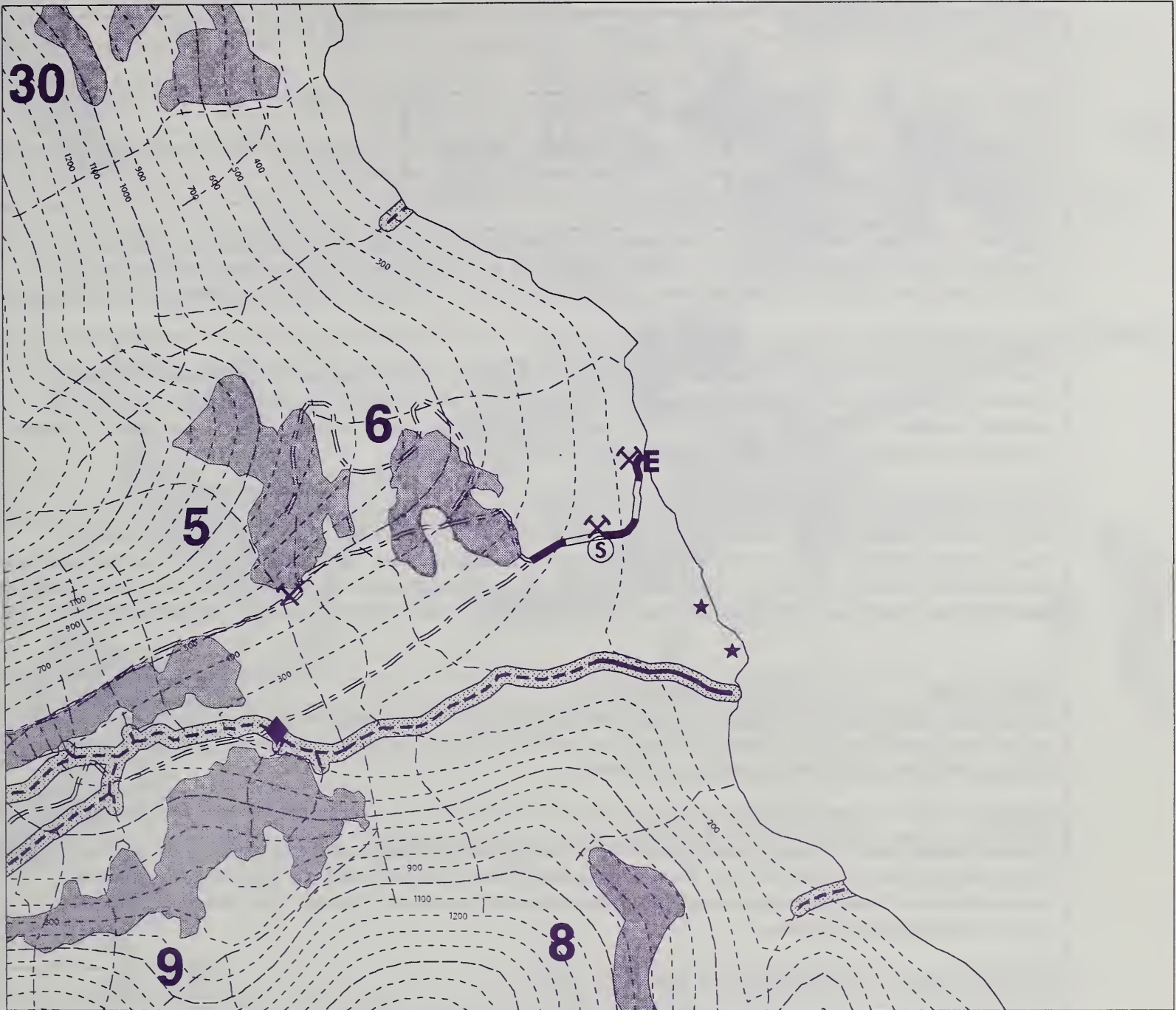
a,b,c    Stream Protection Level

Scale/ 4 inches = 1 mile

## KING GEORGE ROAD DESIGN CARDS

SEGMENT NO. 1 (Road 6549)			VCU: 462		
ROAD CLASS: COLLECTOR			SERVICE LEVEL: C		
ALTERNATIVE	1 & 6	2	3	4	5
OBJECTIVE LEVEL	N/A	2	2	2	2
LENGTH	N/A	2070 ft.	2070 ft.	2070 ft.	2070 ft.
# STREAM CROSSINGS - CLASS 1: -0			CLASS 2: -0		
Roads		Comments by: D. Barnett			
Segment 1 begins at the LTF where a borrow source will be developed for 5000 cubic yards of rock. A larger borrow source will be developed at the sort yard site to continue the road. This segment is average road construction.					
Timber /Silviculture		Comments by: R. Hojem/ J. Jordan			
Locate sort yard within 1/4 mile of LTF, in scrub timber. Retain timber where possible for screening. Design additional turnouts to handle heavy traffic between sort yard and LTF. Maintain road access for at least 5 years after harvest for implementation of silvicultural activities.					
Watershed/Fisheries		Comments by: J. Thompson/ D. Reed			
No mappable streams cross this road segment. No concerns apart from rock pit (BMP 14.18), sort yard and LTF erosion control. Important to maintain good crown shape of surface, cross drains, and ditchlines on steep grade approaching LTF (BMP 14.9).					
Soils/Geology		Comments by: J. deMontigny			
Primarily deep organic soils (wetlands) along this road segment, with well drained mineral soils near the beach. Cut slopes should be stabilized to minimize soil erosion (BMP 14.8).					
Wildlife		Comments by: S. Posner			
This road bisects areas of old growth habitat and minimizes habitat effectiveness of the surrounding forest. Restricting access to non-motorized travel would benefit habitat values.					
Visual/Recreation		Comments by: M. Mitchell/ D. Galla			
Provides improved access for hiking, biking or motorized use to the central portions of the study area, including partial access to the pass to Kunk Lake. Keeping it open would favor motorized use while closure would benefit hikers and bikers. Minimize clearing widths. This segment is partially visible from Zimovia Strait.					
Access Management		Comments by: IDT			
The road would remain open under Alternatives 2, 3, 4 and 5.					

# ROAD SEGMENT 1



- Proposed Road Segment
- Adjacent Proposed Road Segments
- Class 1 Streams
- Class 2 Streams
- Class 3 Streams
- Proposed Major Stream Crossing

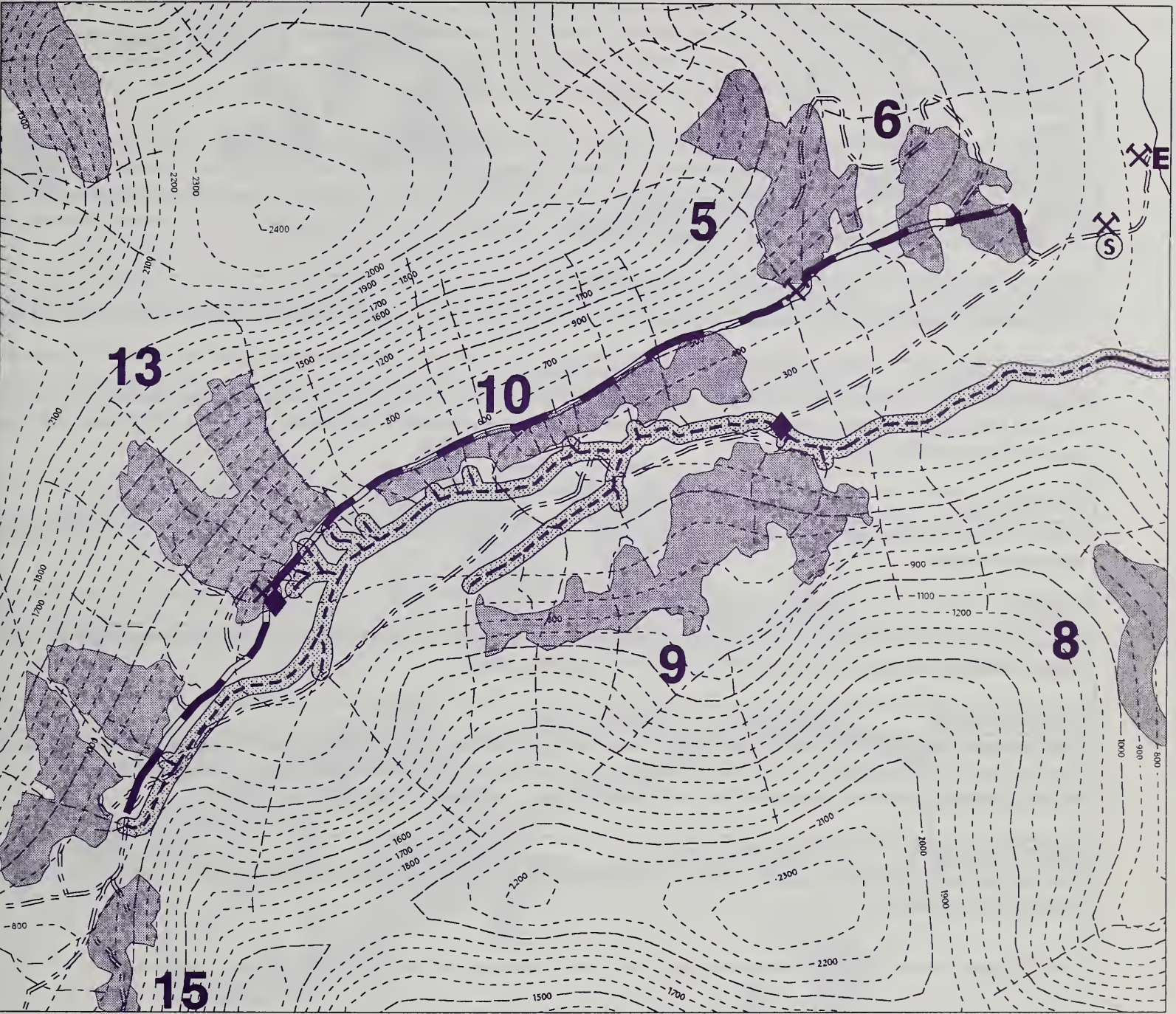
- Proposed cut units
- TTRA Buffers
- Saltwater and Lakes
- Eagle Nest Tree
- Proposed Log Transfer Facility
- Proposed Rock Pit Site
- Proposed Sortyard Site

Scale: 3 inches = 1 mile

# KING GEORGE ROAD DESIGN CARDS

SEGMENT NO. 2 (Road 6549)			VCU: 462		
ROAD CLASS: COLLECTOR				SERVICE LEVEL: C	
ALTERNATIVE	1 & 6	2	3	4	5
OBJECTIVE LEVEL	N/A	2	2	2	2
LENGTH	N/A	3520 ft.	14,109 ft.	14,109 ft.	14,109 ft.
# STREAM CROSSINGS - CLASS 1: -0			CLASS 2: -1		
Roads	Comments by: D. Barnett				
Segment 2 is average road building. In some areas where the road cuts through alluvial sidehill riprap walls may be required to prevent sloughing (BMP 14.7). Roll grade through stream crossings to ensure stream containment (BMP 14.3). There is one hydro site which has been designed as a 73" x 55" CMP Arch. Proposed borrow sites avoid streams.					
Timber/Silviculture	Comments by: R. Hojem/ J. Jordan				
Keep road as high as possible on the hillslope. Unit 10 will require several landings and includes areas designed for mobile track yarder or shovel. Deck logs along low side of road. Units 13 and 14 will have landings established for downhill yarding. Keep road open for at least 5 years after sale for silvicultural management and small sales. Minimize road and road clearing widths to reduce blowdown along this road segment.					
Watershed/Fisheries	Comments by: J. Thompson/ D. Reed				
Report on file comparing road segments 2 and 9. Road crosses the footslope where several streams (HC2 and HC5 channel types, 1 meter wide) lose containment, resulting in small alluvial fans. The alignment hovers near the transition between Class II and III. Rolling grade will achieve better stream containment at crossings. Borrow sites will require site specific erosion control and rehabilitation plans due to high stream frequency and proximity to fish habitat (BMP 14.18).					
Soils/Geology	Comments by: J. deMontigny				
The hillslope above the road has numerous deeply incised v-notches. Recent debris torrents have deposited material across the proposed road line. Prompt stabilization of cut and fill slopes is recommended to minimize surface erosion. Retaining wall may be needed to control surface ravel.					
Wildlife	Comments by: S. Posner				
This road bisects areas of old growth habitat and minimizes habitat effectiveness of the surrounding forest. The full length of this road also runs through one of the major large mammal travel corridors within the study area. The road may increase harvest of some game species and furbearers within the Honeymoon drainage. Restricting access to walk-in travel would benefit habitat values.					
Visual/Recreation	Comments by: M. Mitchell/ D. Galla				
Provides improved access for hiking, biking or motorized use to the central portions of the study area, including partial access to the pass to Kunk Lake and Bessie Peak area. Keeping it open would favor motorized use while restricting motorized traffic. Portions of this road will be visible for approximately 15 years through unit 6.					
Access Management	Comments by: IDT				
The road would remain open under Alternatives 2, 3, 4 and 5.					

# ROAD SEGMENT 2



- Proposed Road Segment
- Adjacent Proposed Road Segments
- Class 1 Streams
- Class 2 Streams
- Class 3 Streams
- Proposed Major Stream Crossing

- Proposed cut units
- TTRA Buffers
- Saltwater and Lakes
- Eagle Nest Tree
- Proposed Log Transfer Facility
- Proposed Rock Pit Site
- Proposed Sortyard Site

Scale: 3 inches = 1 mile

## KING GEORGE ROAD DESIGN CARDS

SEGMENT NO. 3 (Road 51491)				VCU: 462	
ROAD CLASS: LOCAL				SERVICE LEVEL: D	
ALTERNATIVE	1 & 6	2	3	4	5
OBJECTIVE LEVEL	N\A	N\A	1	1	1
LENGTH	N\A	N\A	2500 ft	4170 ft.	4170 ft.
# STREAM CROSSINGS - CLASS 1: -0			CLASS 2: -0		
Roads		Comments by: D. Barnett			
The first 1000 ft. is on moderately steep sideslopes, 40-60%.					
Timber/Silviculture		Comments by: R. Hojem/ J. Jordan			
High location is good for uphill yarding. Deflection within units is not great. Location allows for mobil yarding most of Unit 6.					
Watershed/Fisheries		Comments by: J. Thompson/ D. Reed			
Road crosses two very wet slopes in vicinity north of Units 5 and 6 that will require extra cross-drainage. Drivable cross ditches installed after timber harvest is complete will safeguard minor drainage structures and minimize erosion in the event of drainage structure failure (BMP 14.9).					
Soils/Geology		Comments by: J. deMontigny			
Basil till is the dominant parent material along this stretch of road. Prompt seeding and fertilization (BMP 12.17) will minimize sediment transport.					
Wildlife		Comments by: S. Posner			
Improved access may increase harvest of some game species and furbearers in this fairly high to medium value ungulate winter range. Restricting access to walk-in travel would benefit habitat values.					
Visual/Recreation		Comments by: M. Mitchell/ D. Galla			
Road has been modified to minimize what can be seen from Wrangell Island and Zimovia Strait for a period of up to 15 years. The road may provide some access for hiking, biking, or motorized use but there is little recreation attraction other than dispersed hunting. Prevent continuous alder establishment along road through grass seeding.					
Access Management		Comments by: IDT			
After harvest activities and associated clean up are complete, this road segment will be blocked with a removable barrier at the Junction of Road 6549.					

# ROAD SEGMENT 3

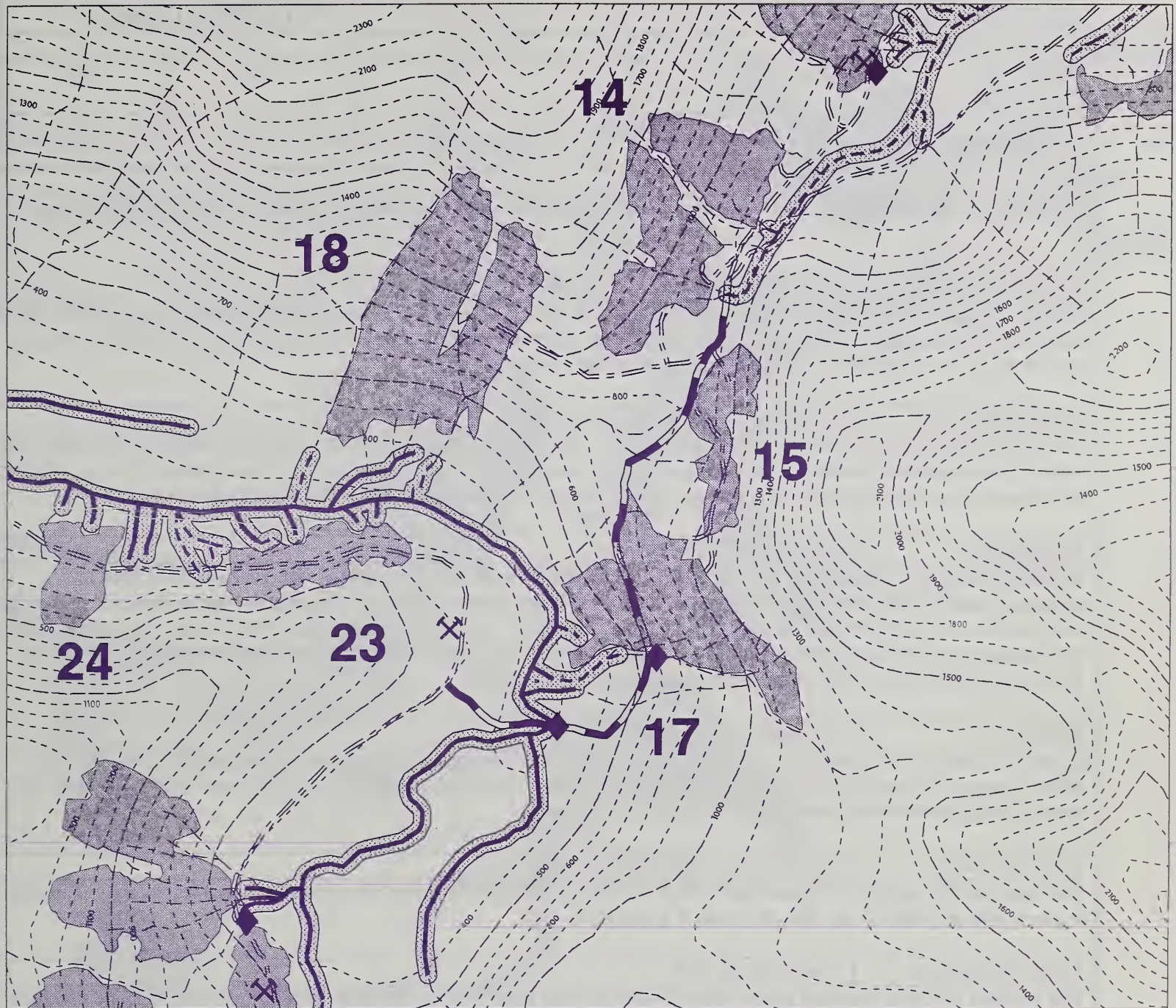















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|--|---------------------------------|--|--------------------------------|
|  | Proposed Road Segment           |  | Proposed cut units             |
|  | Adjacent Proposed Road Segments |  | TTRA Buffers                   |
|  | Class 1 Streams                 |  | Saltwater and Lakes            |
|  | Class 2 Streams                 |  | Eagle Nest Tree                |
|  | Class 3 Streams                 |  | Proposed Log Transfer Facility |
|  | Proposed Major Stream Crossing  |  | Proposed Rock Pit Site         |
|  | Scale: 3 inches = 1 mile        |  | Proposed Sortyard Site         |

# KING GEORGE ROAD DESIGN CARDS

SEGMENT NO. 4 (Road 6549)				VCU: 462	
ROAD CLASS: COLLECTOR				SERVICE LEVEL: C	
ALTERNATIVE	1 & 6	2	3	4	5
OBJECTIVE LEVEL	N/A	2	2	N/A	1 & 2
LENGTH	N/A	6835 ft.	6835 ft.	N/A	6835 ft.
# STREAM CROSSINGS - CLASS 1: -1		CLASS 2: -0			
Roads		Comments by: D. Barnett			
<p>There are two major hydro sites in this section. The first is designed as a 95" x 67" CMPA with wire wall gabion. King George Creek crossing is Class I and will be crossed with a 70' prefabricated bridge with 66" x 51" CMPA for an intermittent overflow channel. The section of road coming through the pass from Honeymoon to King George, about 400 ft. in length, is on 60-80% sideslopes and will require full bench with end haul (BMP 14.7).</p>					
Timber/Silviculture		Comments by: R. Hojem/ J. Jordan			
<p>Recommend mobile yarder for northern tip of Unit 15 (downhill yarding). Yard east portion of Unit 17 uphill to temporary road. Maintain access until harvest along road segments 6, 7, and 8 is complete.</p>					
Watershed/Fisheries		Comments by: J. Thompson/ D. Reed			
<p>Road has been located to minimize stream crossings and utilize crossing sites that are as stable as possible (BMP 14.2). Designate stable end haul site away from streams (BMP 14.12). First hydro site is channel type HC6 with high debris loads. Structure design addresses channel stability concerns, but this will be a high maintenance risk and must be routinely inspected for maintenance needs (BMP 14.20). I've reviewed three Upper King George Creek crossing sites; this one minimizes tributary crossings in approach while providing a relatively stable floodplain crossing. Design drawings contain site specific BMPs for structure installation, including timing restrictions on King George Creek. All structures (and structure maintenance plans) should consider the fact that beavers are very active in the vicinity of King George Creek and its tributaries.</p>					
Soils/Geology		Comments by: J. deMontigny			
<p>The segment of road with 60-80% slopes has moderately well drained soils. Slope stabilization may be necessary at the v-notch crossings (BMP 14.7). Soils in the floodplain near the stream crossing are developed in deep sand deposits; soils are somewhat poorly to poorly drained.</p>					
Wildlife		Comments by: S. Posner			
<p>This road segment crosses into the King George watershed which contains most of the retained old growth designated under this project. Wildlife values are high in this watershed. Honeymoon pass at the beginning of this road segment goes through a "pinch point" in an important travel corridor. Restricting access to walk-in use would benefit wildlife conservation values.</p>					
Visual/Recreation		Comments by: M. Mitchell/ D. Galla			
<p>Portions of this road that cross unit 17 would be seen in the background from Stikine Strait. The road would provide access to hikers, bikers and motorized use across King George Creek and into the upper basin. If motorized use is restricted, the road would provide access for fishing.</p>					
Access Management		Comments by: IDT			
<p>Engineering design and hydraulic analysis has been completed on two hydro sites. A survey at another site determined that an oversized CMP would be suitable without further design work. Under Alternative 2 and 3, the road would remain open. Under Alternative 5 access would be restricted to motorized use at the first hydrosite (see map). This road will be managed at maintenance level 2 up to the gate. After the gate, this road segment will be managed with operational maintenance level 2 during the intermittent life of the project with post-project objective maintenance level 1. The gate will give periodic access for such activities as; fisheries, silviculture, small sales, wildlife, etc.</p>					

# ROAD SEGMENT 4

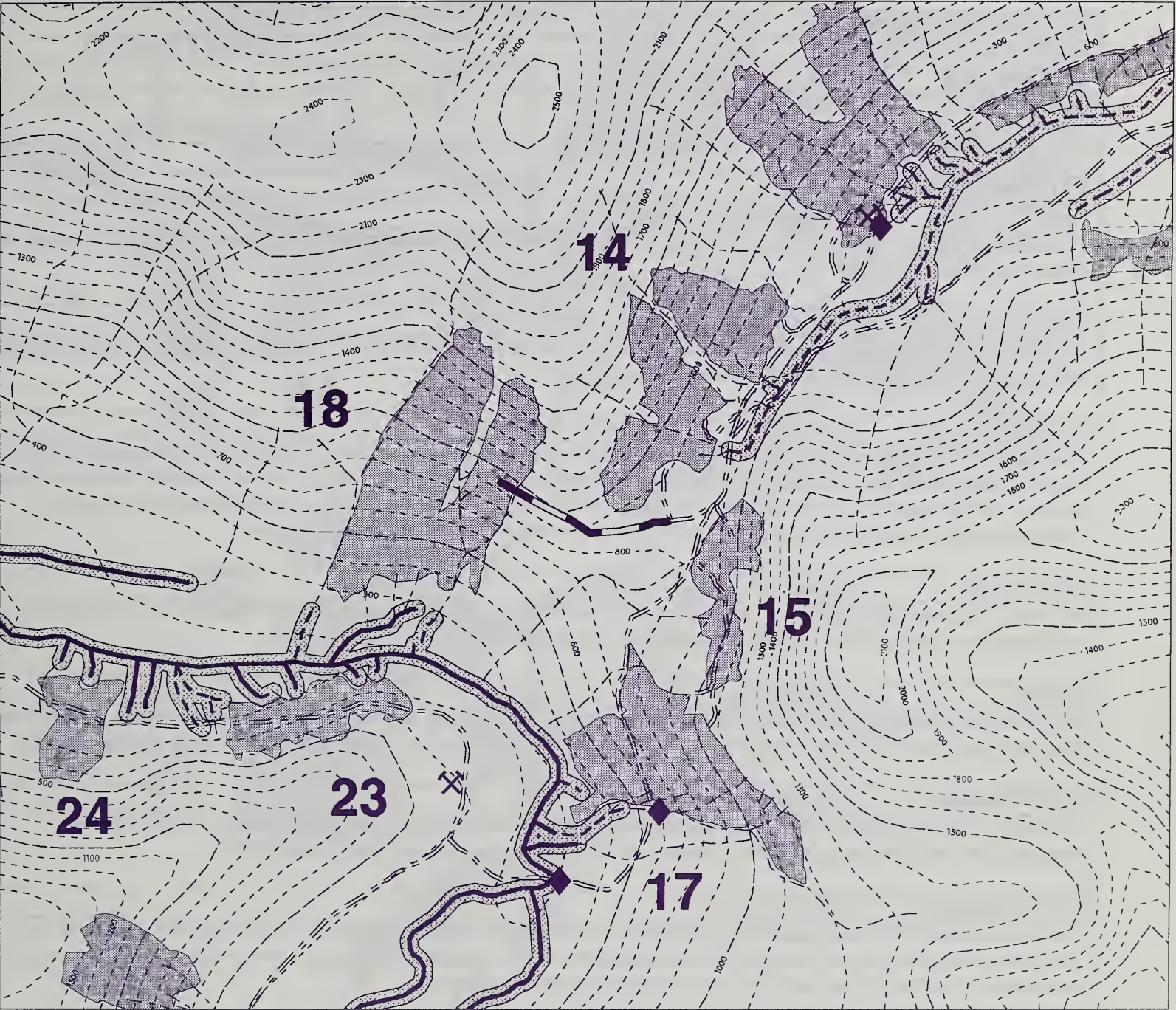















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|--|---------------------------------|---|--------------------------------|
|  | Proposed Road Segment           |  | Proposed cut units             |
|  | Adjacent Proposed Road Segments |  | TTRA Buffers                   |
|  | Class 1 Streams                 |  | Saltwater and Lakes            |
|  | Class 2 Streams                 |  | Eagle Nest Tree                |
|  | Class 3 Streams                 |  | Proposed Log Transfer Facility |
|   | Proposed Major Stream Crossing  |  | Proposed Rock Pit Site         |
| Scale: 3 inches = 1 mile   |                                 |  | Proposed Sortyard Site         |

# KING GEORGE ROAD DESIGN CARDS

SEGMENT NO. 5			VCU: 462		
ROAD CLASS: TEMPORARY				SERVICE LEVEL: D	
ALTERNATIVE	1 & 6	2	3	4	5
OBJECTIVE LEVEL	N/A	1	N/A	N/A	N/A
LENGTH	N/A	2600 ft.	N/A	N/A	N/A
# STREAM CROSSINGS - CLASS 1: -0			CLASS 2: -0		
Roads		Comments by: D. Barnett			
This section is on 40% and less sideslopes for the first half then the sideslopes steepen to 40-60%. It provides access to unit 18.					
Timber/Silviculture		Comments by: R. Hojem/ J. Jordan			
Develop skyline landing at end of road (first landing in Unit 18). Road will also be used for helicopter landing of upper half of Unit 18 (IR5 prescription). A potential future unit is located between Units 14 and 18. Road should not be extended beyond Unit 18 due to steep sideslopes and very large v-notch west of Unit 18.					
Watershed/Fisheries		Comments by: J. Thompson/ D. Reed			
Class III stream at Unit 18 west boundary is road-stopper. Road crosses Class III streams. Consider ending the specified road in the eastern portion of the unit and extending temporary road toward the west boundary, but this section could be a problem for temporary road construction. Class I (beaver pond) habitat is located greater than 1700' directly downslope.					
Soils/Geology		Comments by: J. deMontigny			
Soils are somewhat poorly drained with basal till parent material along this road segment. The first section of road has moderate slopes. At the unit boundary, the road crosses an old landslide tract. Within the unit, the road is located on a bench, with steep slopes below the road. A short section of road has 60% + slopes where it crosses a small stream. The steep slopes with evidence of past failure indicate that there is a high risk of slope failure. There is a high chance that sediment would go directly into King George creek if hillslope failure occurs in Unit 18.					
Wildlife		Comments by: S. Posner			
Improved access to the south-facing slope of the King George watershed may increase hunting pressure and reduce effectiveness of designated old growth habitat areas further west. This road crosses an important travel corridor. Restricting access to walk-in use would benefit wildlife conservation values.					
Visual/Recreation		Comments by: M. Mitchell/ D. Galla			
This road would provide limited additional access for hiking, biking or motorized use except for dispersed hunting. This road segment may be visible in the background from Bessie Peak.					
Access Management		Comments by: IDT			
This segment will have restricted access where it takes off from Road 6549 by blocking, access, removing drainage structures, and restoring the natural drainage patterns (BMP 14.24). Under Alternative 5, this road is dropped (BMP 14.7).					

# ROAD SEGMENT 5

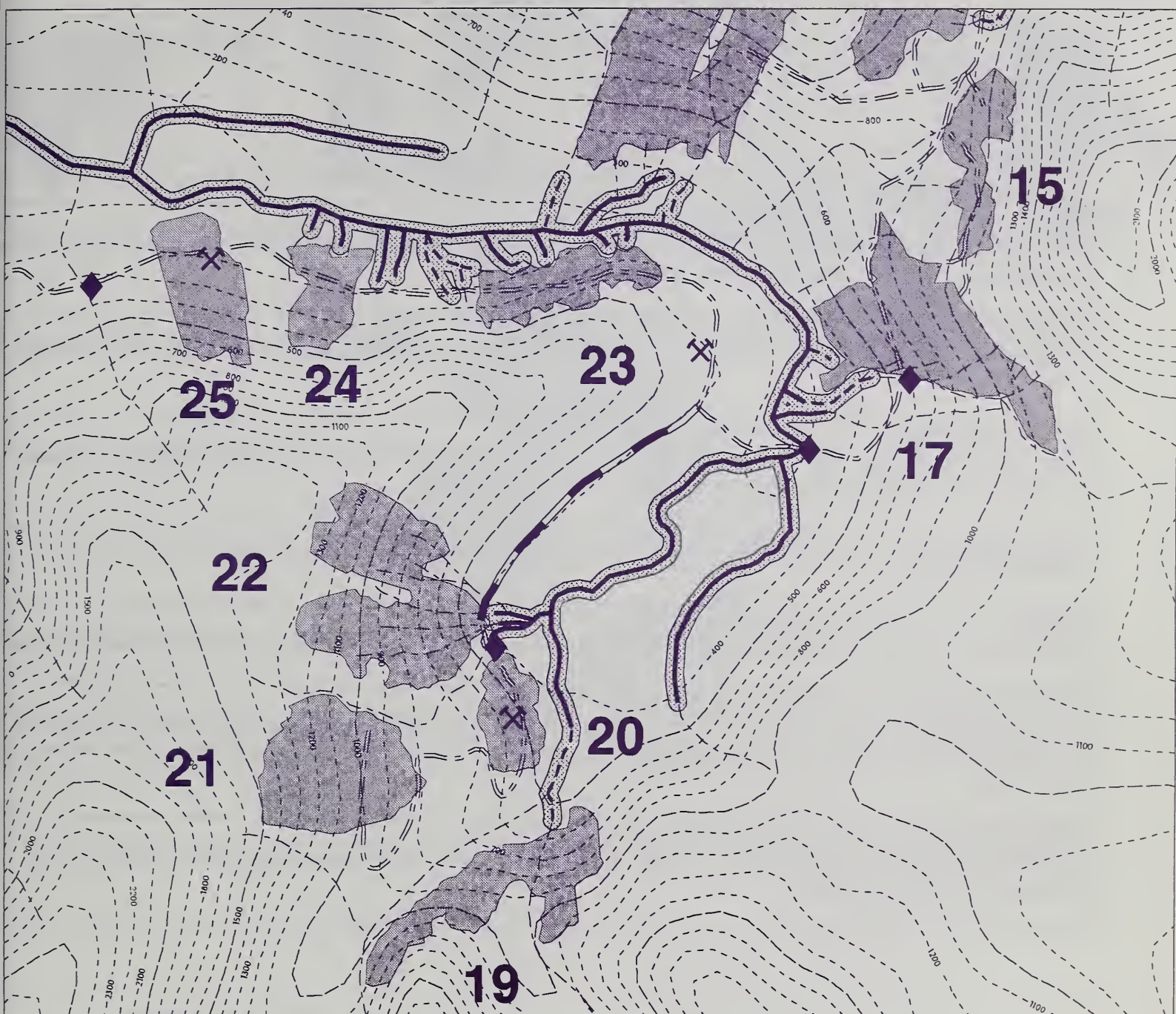


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|--|--|
|  Proposed Road Segment           |  Proposed cut units             |
|  Adjacent Proposed Road Segments |  TTRA Buffers                   |
|  Class 1 Streams                 |  Saltwater and Lakes            |
|  Class 2 Streams                 |  Eagle Nest Tree                |
|  Class 3 Streams                 |  Proposed Log Transfer Facility |
|  Proposed Major Stream Crossing  |  Proposed Rock Pit Site         |
| Scale: 3 inches = 1 mile   |  Proposed Sortyard Site         |

## KING GEORGE ROAD DESIGN CARDS

SEGMENT NO. 6 (Road 51493)				VCU: 462	
ROAD CLASS: LOCAL				SERVICE LEVEL: D	
ALTERNATIVE	1 & 6	2	3	4	5
OBJECTIVE LEVEL	N/A	1 & 2	2	N/A	1 & 2
LENGTH	N/A	3960 ft.	3960 ft.	N/A	3960 ft.
# STREAM CROSSINGS - CLASS 1: -0		CLASS 2: -0			
Roads		Comments by: D. Barnett			
This segment is typical construction on flat sideslopes. Roll grade through stream crossings in vicinity of Unit 22 to assure good stream containment (BMP 14.3).					
Timber/Silviculture		Comments by: R. Hojem/ J. Jordan			
Keep road as high on slope as possible. Maintain road for five years after harvest of Units 19-22 to facilitate silviculture needs and salvage if needed. Move upslope in lower east end of Unit 22.					
Watershed/Fisheries		Comments by: J. Thompson/ D. Reed			
Favor alignment as high on slope as reasonable to access lower portion of Unit 22. Road crosses very wet slope east of Unit 22 and will require extra cross drainage. Several Class III streams at east boundary of Unit 22. Do not combine streams into single structures as this could dewater downstream fish habitat (BMP 14.17). Install drivable cross-ditches upon road closure to safeguard minor drainage structures (BMP 14.20). Maintain integrity of existing beaver pond(s).					
Soils/Geology		Comments by: J. deMontigny			
No special concerns. Revegetation for erosion control should be completed in a timely manner (BMP 12.17). Numerous choris bog orchids, a sensitive plant, were located along this road segment.					
Wildlife		Comments by: S. Posner			
This road bisects areas of old growth habitat. Improved access may increase harvest of some large game species and furbearers. Restricting access to walk-in use would benefit using the travel corridor between Kunk Lake and the King George drainage.					
Visual/Recreation		Comments by: M. Mitchell/ D. Galla			
The road could provide access to hikers, bikers and motorized use into the upper King George basin. Parts of the road, particularly the segments that pass through harvest units will be visible by hikers from Bessie Peak.					
Access Management		Comments by: IDT			
This road segment will remain open under Alternative 3 and maintained at maintenance level 2. Motorized access will be restricted under Alternatives 2 and 5 and this road segment will be managed with operational maintenance level 2 during the intermittent life of the project with post-project objective maintenance level 1.					

# ROAD SEGMENT 6

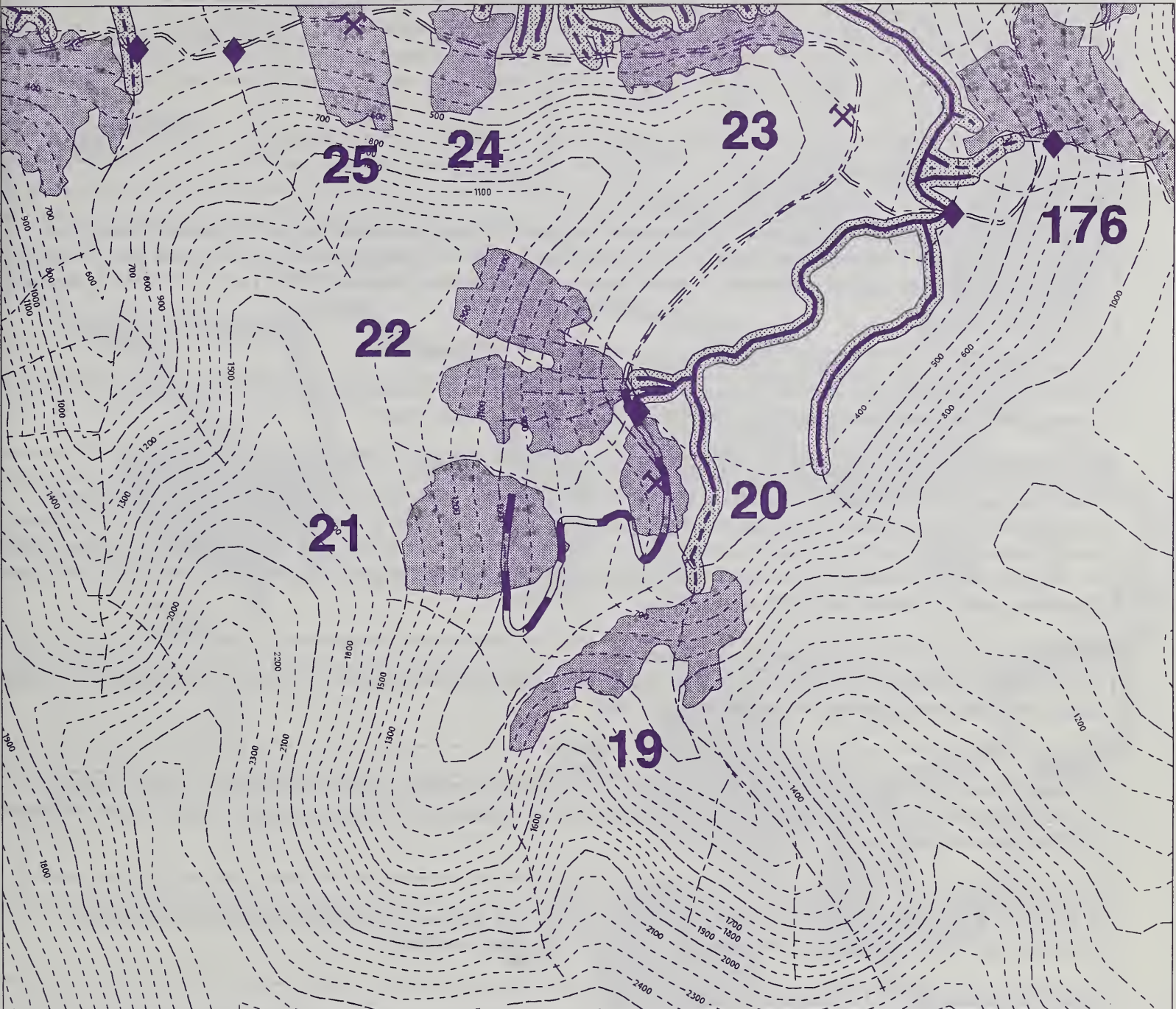















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|--|---------------------------------|--|--------------------------------|
|  | Proposed Road Segment           |  | Proposed cut units             |
|  | Adjacent Proposed Road Segments |  | TTRA Buffers                   |
|  | Class 1 Streams                 |  | Saltwater and Lakes            |
|  | Class 2 Streams                 |  | Eagle Nest Tree                |
|  | Class 3 Streams                 |  | Proposed Log Transfer Facility |
|  | Proposed Major Stream Crossing  |  | Proposed Rock Pit Site         |
|  | Scale: 3 inches = 1 mile        |  | Proposed Sortyard Site         |

# KING GEORGE ROAD DESIGN CARDS

SEGMENT NO. 7			VCU: 462		
ROAD CLASS: LOCAL				SERVICE LEVEL: D	
ALTERNATIVE	1 & 6	2	3	4	5
OBJECTIVE LEVEL	N/A	1	1	N/A	1
LENGTH	N/A	6670 ft.	6670 ft.	N/A	6670 ft.
# STREAM CROSSINGS - CLASS 1: -0			CLASS 2: -1		
Roads		Comments by: D. Barnett			
This segment is typical construction on 20-40% sideslopes. One hydro site was dropped entirely. One hydro site was designed as a native log stringer bridge to be removed upon road closure.					
Timber/Silviculture		Comments by: R. Hojem/ J. Jordan			
Need to push switchback south of Unit 21 to gain elevation within Unit 21. Fly helicopter volume from Unit 19 to landings in Units 20 and 21.					
Watershed/Fisheries		Comments by: J. Thompson/ D. Reed			
See segment 6 comments. Road crosses no mappable streams beyond the log stringer. Log stringer addresses long term maintenance risks associated with bedload transport at this site (BMP 14.17).					
Soils/Geology		Comments by: J. deMontigny			
No special concerns.					
Wildlife		Comments by: S. Posner			
This road bisects areas of old growth habitat. Improved access may increase harvest of some large game species and furbearers					
Visual/Recreation		Comments by: M. Mitchell/ D. Galla			
The road could provide limited access to hikers, bikers and motorized use into the upper King George basin but there is no recreational attraction. Parts of the road, particularly the segments that pass through harvest units will be visible by hikers from Bessie Peak.					
Access Management		Comments by: IDT			
This road segment will be closed under Alternatives 2, 3 and 5 by blocking access, removing all drainage structures, and restoring natural drainage patterns.					

# ROAD SEGMENT 7



- |  |  |
|--|--|
|  Proposed Road Segment           |  Proposed cut units             |
|  Adjacent Proposed Road Segments |  TTRA Buffers                   |
|  Class 1 Streams                 |  Saltwater and Lakes            |
|  Class 2 Streams                 |  Eagle Nest Tree                |
|  Class 3 Streams                 |  Proposed Log Transfer Facility |
|  Proposed Major Stream Crossing   |  Proposed Rock Pit Site         |
| Scale: 3 inches = 1 mile   |  Proposed Sortyard Site         |

# KING GEORGE ROAD DESIGN CARDS

SEGMENT NO. 8 (Road 6549)				VCU: 462	
ROAD CLASS: COLLECTOR				SERVICE LEVEL: D	
ALTERNATIVE	1 & 6	2	3	4	5
OBJECTIVE LEVEL	N/A	1 & 2	N/A	N/A	1 & 2
LENGTH	N/A	12,870 ft.	N/A	N/A	12,870 ft.
# STREAM CROSSINGS - CLASS 1: -0		CLASS 2: -1			
Roads		Comments by: D. Barnett			
<p>There are two hydro sites in this segment. Both have been designed as native log stringer bridges to be removed upon road closure. Construction is typical except at the last hydro site where 300 feet of controlled blasting and end haul may be required. This site may require special erosion control measures based on soil materials encountered (BMP 14.7, 12.17). Rock pits avoid streams.</p>					
Timber/Silviculture		Comments by: R. Hojem/ J. Jordan			
<p>Locate road to facilitate both uphill and downhill yarding. Maintain access for silvicultural needs following harvest for at least 5 years. Minimize road clearing widths to reduce blowdown along this road segment.</p>					
Watershed/Fisheries		Comments by: J. Thompson/ D. Reed			
<p>Watch for unstable sand deposits in vicinity of Unit 24 which will require a site-specific erosion control plan. Road crosses several small Class III streams. Log stringers address long-term maintenance risks at both hydro sites (BMP 14.17). Approach on west side of last hydro site will require special erosion control measures to control blasting and sediment transport depending on soil materials encountered during construction. Road crosses Class II habitat at last hydro site. This is an HC2 channel type. The class I habitat is greater than 1000' downstream.</p>					
Soils/Geology		Comments by: J. deMontigny			
<p>Deep stratified sand deposits, as mentioned above, should receive immediate stabilization. Encourage alder regeneration along road for wildlife cover, diversity and enhanced productivity.</p>					
Wildlife		Comments by: S. Posner			
<p>This road bisects areas of old growth habitat. Improved access to the lower King George watershed may increase hunting pressure and reduce the effectiveness of this designated old growth habitat area. Restricting access to walk-in use would benefit wildlife conservation values.</p>					
Visual/Recreation		Comments by: M. Mitchell/ D. Galla			
<p>A portion of this road segment may be visible from Stikine Strait. The road would provide access to hikers, bikers and motorized use across King George Creek and into the lower King George drainage.</p>					
Access Management		Comments by: IDT			
<p>This road segment will have restricted motorized access under Alternatives 2 and 5. This road segment will be managed with operational maintenance level 2 during the intermittent life of the project with post-project objective maintenance level 1. Drivable cross-ditches will be installed at road closure to safeguard minor drainage structures. The end of the road will be closed, with all drainage structures removed and natural drainage patterns restored.</p>					

# ROAD SEGMENT 8

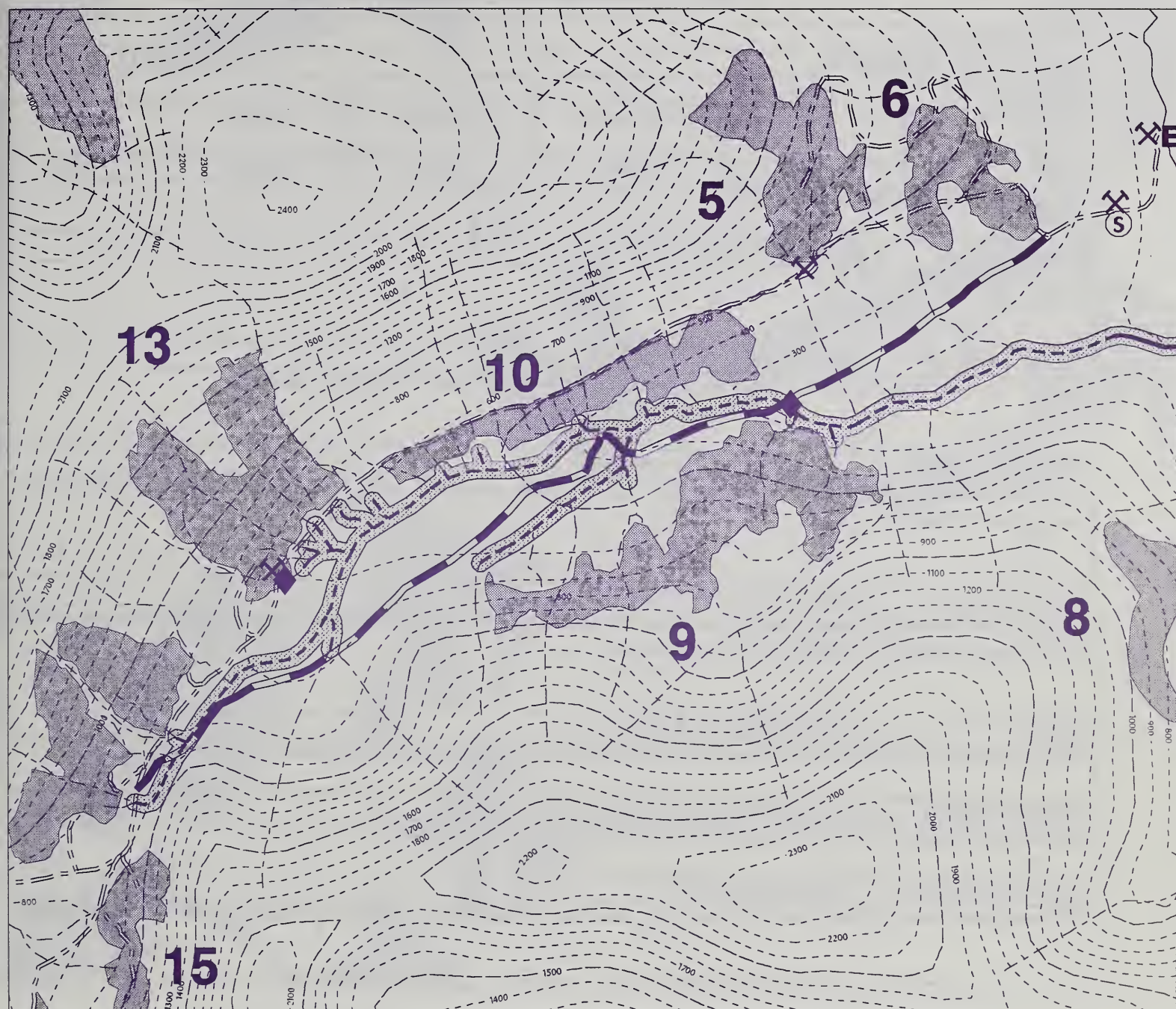















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|--------------------------|---------------------------------|--|--------------------------------|
|                          | Proposed Road Segment           |  | Proposed cut units             |
|                          | Adjacent Proposed Road Segments |  | TTRA Buffers                   |
|                          | Class 1 Streams                 |  | Saltwater and Lakes            |
|                          | Class 2 Streams                 |  | Eagle Nest Tree                |
|                          | Class 3 Streams                 |  | Proposed Log Transfer Facility |
|                          | Proposed Major Stream Crossing  |  | Proposed Rock Pit Site         |
| Scale: 3 inches = 1 mile |                                 |  | Proposed Sortyard Site         |

# KING GEORGE ROAD DESIGN CARDS

SEGMENT NO. 9			VCU: 462		
ROAD CLASS: COLLECTOR				SERVICE LEVEL: D	
ALTERNATIVE	1 & 6	2	3	4	5
OBJECTIVE LEVEL	N/A	2	N/A	N/A	N/A
LENGTH	N/A	12,998 ft.	N/A	N/A	N/A
# STREAM CROSSINGS - CLASS 1: -0 CLASS 2: -3					
Roads		Comments by: D. Barnett			
This section contains one hydro site which will need a 60" cmp or larger. It is easy construction as the road follows the muskegs up the valley. This will increase the cost because of the extra rock needed for subsidence.					
Timber/Silviculture		Comments by: R. Hojem/ J. Jordan			
This road segment could be used to access Unit 9 with a cable system, rather than helicopter. No other potential harvest exists along this road. Maintain road access for at least 5 years for silvicultural activities.					
Watershed/Fisheries		Comments by: J. Thompson/ D. Reed			
Favor minor adjustment at some crossings to achieve better stream containment. See report comparing Segments 2 and 9. Class II crossings lower down (and mainstem Honeymoon crossing) have good bedrock control. Proper vertical alignment is needed at bridge approaches to minimize direct sedimentation from road surface erosion.					
Soils/Geology		Comments by: J. deMontigny			
This road crosses sedge muskeg and forested/sedge muskegs. Deep organic soils will be common. No special erosion control measures. Culverts should be placed in a way that accommodates the flow of subsurface water.					
Wildlife		Comments by: S. Posner			
Canadian Geese and other birds use the muskeg complex that this road segment will bisect. Improved access into the head of Honeymoon Creek may increase hunting pressure of some game species, birds and furbearers. This road follows an important travel corridor, with a "pinch point" at the west end of the road. Restricting access to walk-in travel would benefit habitat conservation values. Keeping the road open may enhance hunting opportunities.					
Visual/Recreation		Comments by: M. Mitchell/ D. Galla			
Provides improved access for hiking, biking or motorized use to the central portions of the study area, including partial access to Kunk Lake. Keeping it open would favor motorized use while closure would benefit hikers and bikers. This segment goes through an extensive muskeg complex and view should be spectacular.					
Access Management		Comments by: IDT			
This road segment is only constructed in Alternative 2 and it will remain open after harvest.					

# ROAD SEGMENT 9

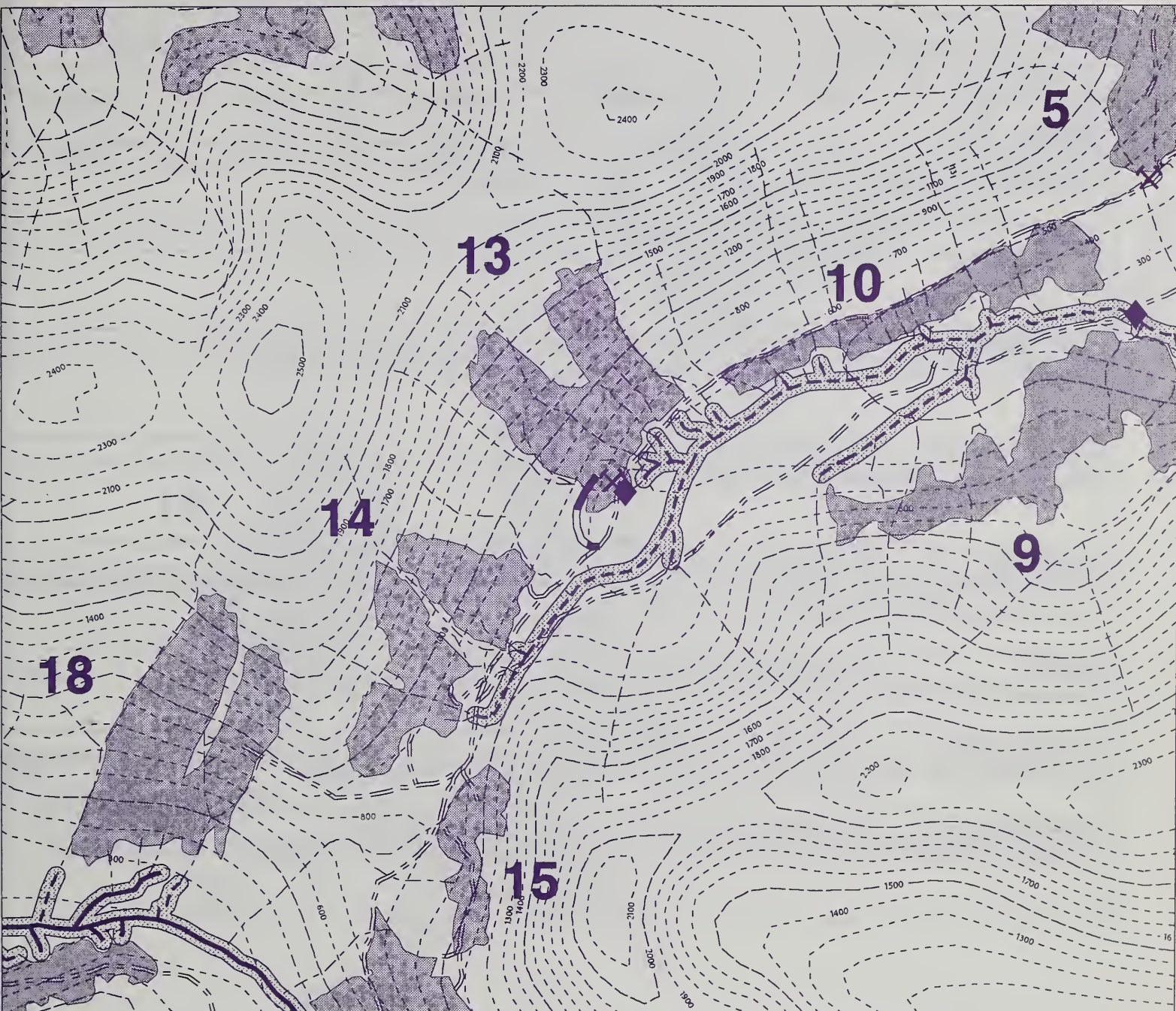















- |  |                                 |   |                                |
|--|---------------------------------|---|--------------------------------|
|  | Proposed Road Segment           |  | Proposed cut units             |
|  | Adjacent Proposed Road Segments |  | TTRA Buffers                   |
|  | Class 1 Streams                 |  | Saltwater and Lakes            |
|  | Class 2 Streams                 |  | Eagle Nest Tree                |
|  | Class 3 Streams                 |  | Proposed Log Transfer Facility |
|  | Proposed Major Stream Crossing  |  | Proposed Rock Pit Site         |
| Scale: 3 inches = 1 mile   |                                 |  | Proposed Sortyard Site         |

# KING GEORGE ROAD DESIGN CARDS

SEGMENT NO. 13			VCU: 462		
ROAD CLASS: TEMPORARY				SERVICE LEVEL: D	
ALTERNATIVE	1 & 6	2	3	4	5
OBJECTIVE LEVEL	N/A	Temporary	Temporary	Temporary	Temporary
LENGTH	N/A	1000 ft.	1000 ft.	1000 ft.	1000 ft.
# STREAM CROSSINGS - CLASS 1: -0			CLASS 2: -0		
Roads		Comments by: D. Barnett			
No comments.					
Timber /Silviculture		Comments by: R. Hojem/ J. Jordan			
Locate this segment to maximize cable yarding and allow for landing zones for helicopter yarding.					
Watershed/Fisheries		Comments by: J. Thompson/ D. Reed			
If possible minimize spur roads by improving specified road alignment uphill. Class III crossing is greater than 800' from class II fish habitat.					
Soils/Geology		Comments by: J. deMontigny			
Consider obliterating temporary road by removing shot rock and re-using it elsewhere if compatible with operator's schedule or for future small sales. Reestablish native vegetation.					
Wildlife		Comments by: S. Posner			
Seeding temporary roads to native grass and forb species that are palatable to elk would benefit wildlife.					
Visual/Recreation		Comments by: M. Mitchell/ D. Galla			
No recreation value. This short road segment is seen from Bessie Peak by hikers.					
Access Management		Comments by: IDT			
This temporary road will be closed after harvest by removing drainage structures and restoring the natural drainage patterns.					

# ROAD SEGMENT 13

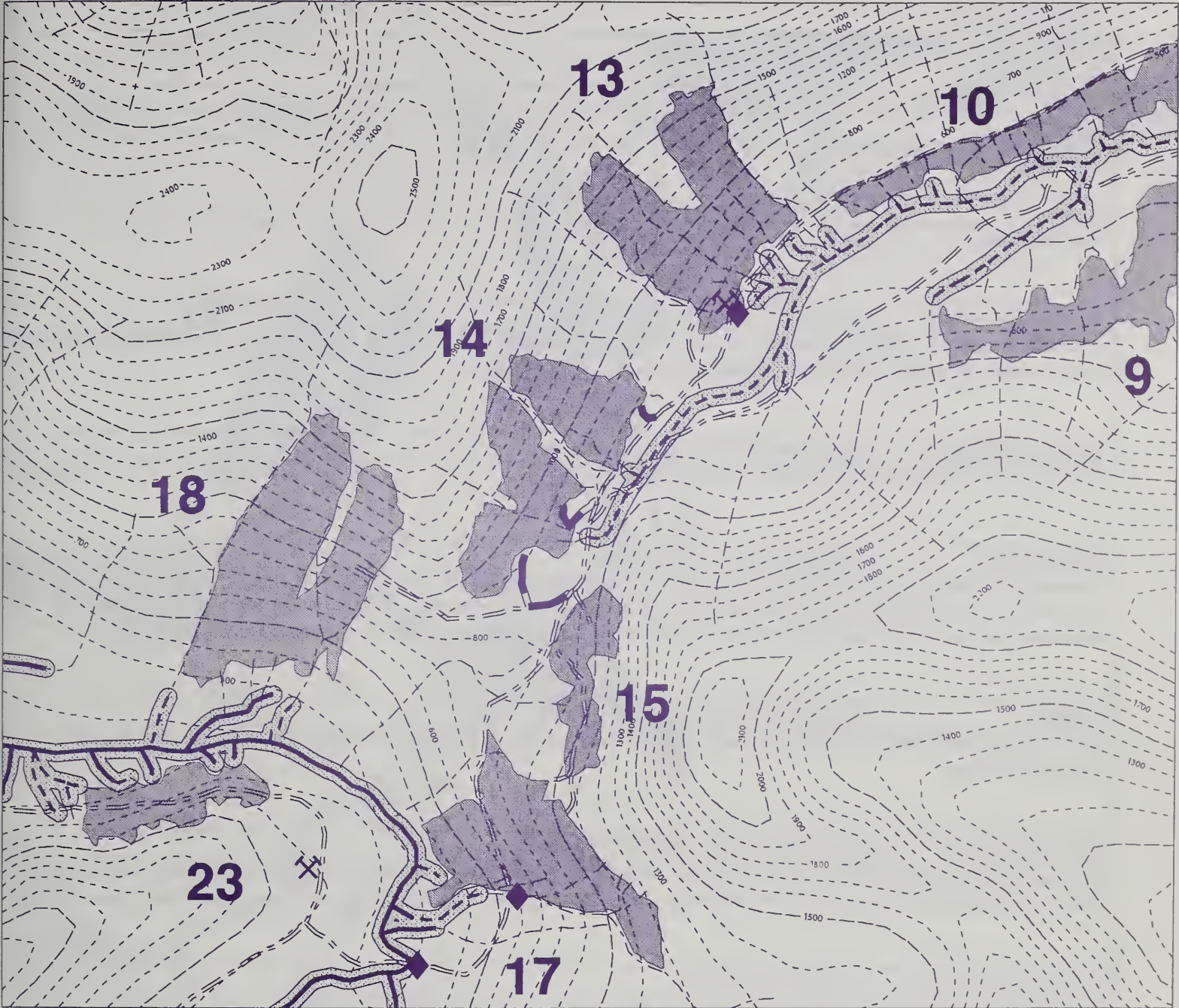


- |  |                                 |   |                                |
|--|---------------------------------|---|--------------------------------|
|  | Proposed Road Segment           |  | Proposed cut units             |
|  | Adjacent Proposed Road Segments |  | TTRA Buffers                   |
|  | Class 1 Streams                 |  | Saltwater and Lakes            |
|  | Class 2 Streams                 |  | Eagle Nest Tree                |
|  | Class 3 Streams                 |  | Proposed Log Transfer Facility |
|  | Proposed Major Stream Crossing  |  | Proposed Rock Pit Site         |
|  | Scale: 3 inches = 1 mile        |  | Proposed Sortyard Site         |

# KING GEORGE ROAD DESIGN CARDS

SEGMENT NO. 14			VCU: 462		
ROAD CLASS: TEMPORARY				SERVICE LEVEL: D	
ALTERNATIVE	1 & 6	2	3	4	5
OBJECTIVE LEVEL	N/A	Temporary	Temporary	Temporary	Temporary
LENGTH	N/A	1100 ft.	1100 ft.	1100 ft.	1100 ft.
# STREAM CROSSINGS - CLASS 1: -0			CLASS 2: -0		
Roads		Comments by: D. Barnett			
No comments.					
Timber /Silviculture		Comments by: R. Hojem/ J. Jordan			
Locate this segment to maximize cable yarding and allow for landing zones for helicopter yarding.					
Watershed/Fisheries		Comments by: J. Thompson/ D. Reed			
Spurs are separated from fish habitat by distances exceeding 100'.					
Soils/Geology		Comments by: J. deMontigny			
Consider obliterating temporary road by removing shot rock and re-using it elsewhere if compatible with operator's schedule or for future small sales. Reestablish native vegetation.					
Wildlife		Comments by: S. Posner			
Seeding temporary roads to native grass and forb species that are palatable to elk would be beneficial.					
Visual/Recreation		Comments by: M. Mitchell/ D. Galla			
No recreation value. This short road segment may be visible from Bessie Peak by hikers.					
Access Management		Comments by: IDT			
This temporary road will be closed after harvest by removing drainage structures and restoring natural drainage patterns.					

# ROAD SEGMENT 14

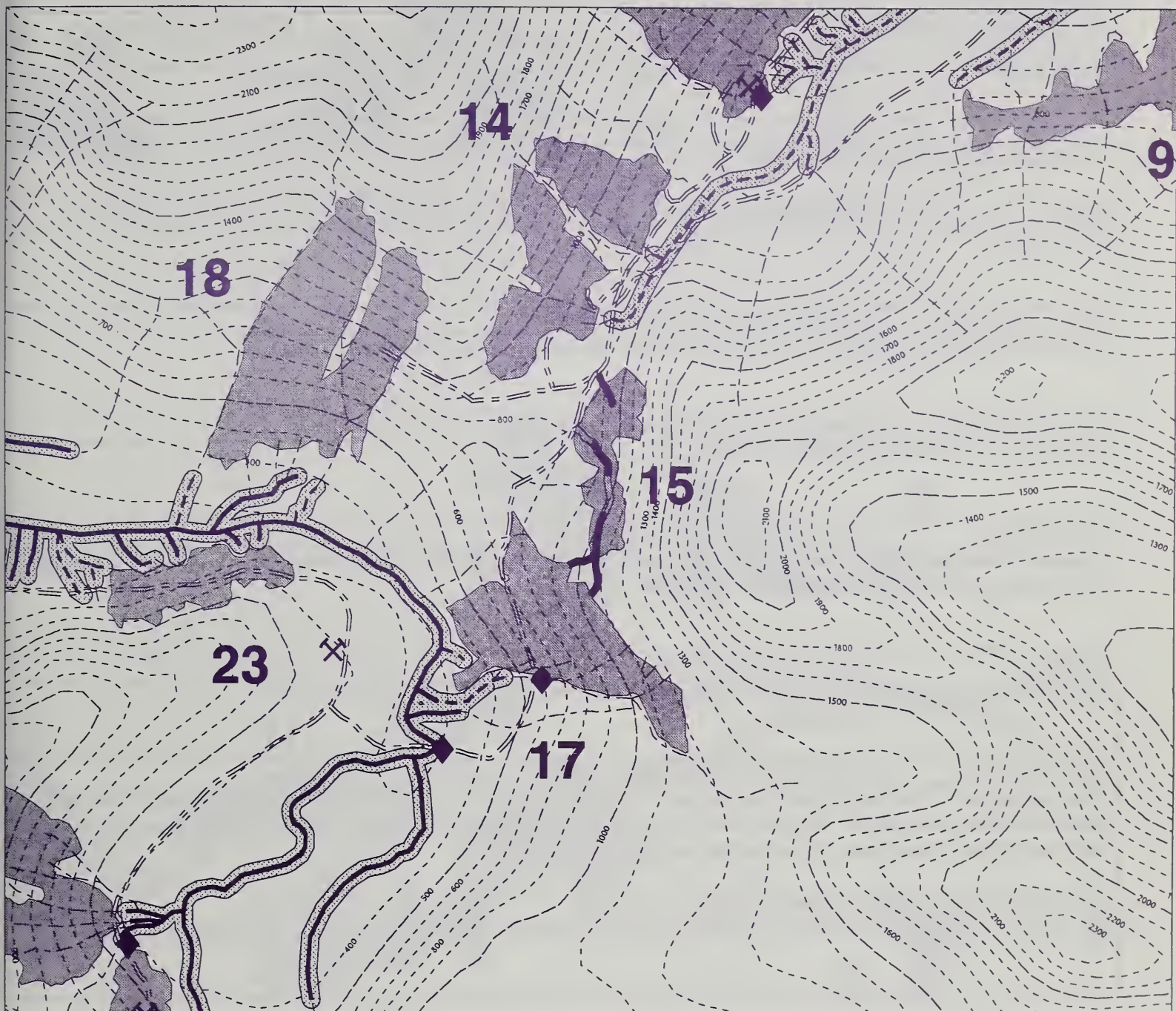















- |                                 |                                |
|---------------------------------|--------------------------------|
| Proposed Road Segment           | Proposed cut units             |
| Adjacent Proposed Road Segments | TTRA Buffers                   |
| Class 1 Streams                 | Saltwater and Lakes            |
| Class 2 Streams                 | Eagle Nest Tree                |
| Class 3 Streams                 | Proposed Log Transfer Facility |
| Proposed Major Stream Crossing  | Proposed Rock Pit Site         |
| Scale: 3 inches = 1 mile        | Proposed Sortyard Site         |

# KING GEORGE ROAD DESIGN CARDS

SEGMENT NO. 17			VCU: 462		
ROAD CLASS: TEMPORARY				SERVICE LEVEL: D	
ALTERNATIVE	1 & 6	2	3	4	5
OBJECTIVE LEVEL	N/A	Temporary	Temporary	Temporary	Temporary
LENGTH	N/A	1980 ft.	1980 ft.	1320 ft.	1980 ft.
# STREAM CROSSINGS - CLASS 1: -0			CLASS 2: -0		
Roads		Comments by: D. Barnett			
No comments.					
Timber /Silviculture		Comments by: R. Hojem/ J. Jordan			
Locate this segment to maximize mobile or shovel logging in unit 15. Allow landing zone for helicopter yarding the southeast corner of unit 17 and maximize uphill yarding in the center of unit 17.					
Watershed/Fisheries		Comments by: J. Thompson/ D. Reed			
No mappable tributaries to fish habitat along this road segment.					
Soils/Geology		Comments by: J. deMontigny			
Sub-surface drainages are common on this road segment. There are organic soils throughout unit 15 until the boundary of unit 17. Construction (and water barring) to facilitate sub-surface water movement. Consider obliterating temporary road by removing shot rock and re-using it elsewhere if compatible with operator's schedule or for future small sales.					
Wildlife		Comments by: S. Posner			
Restricting access along this road would reduce some of the impacts to the travel corridor between Kunk Lake and King George drainages.					
Visual/Recreation		Comments by: M. Mitchell/ D. Galla			
This segment has the potential as a trail to access the pass into Kunk Lake. Foot and/or bike access should be maintained. Place effective motorized closure at the beginning of this road segment. Portions of the road are visible from Stikine Strait.					
Access Management		Comments by: IDT			
This temporary road will be closed after harvest by removing drainage structures and restoring natural drainage patterns.					

# ROAD SEGMENT 17

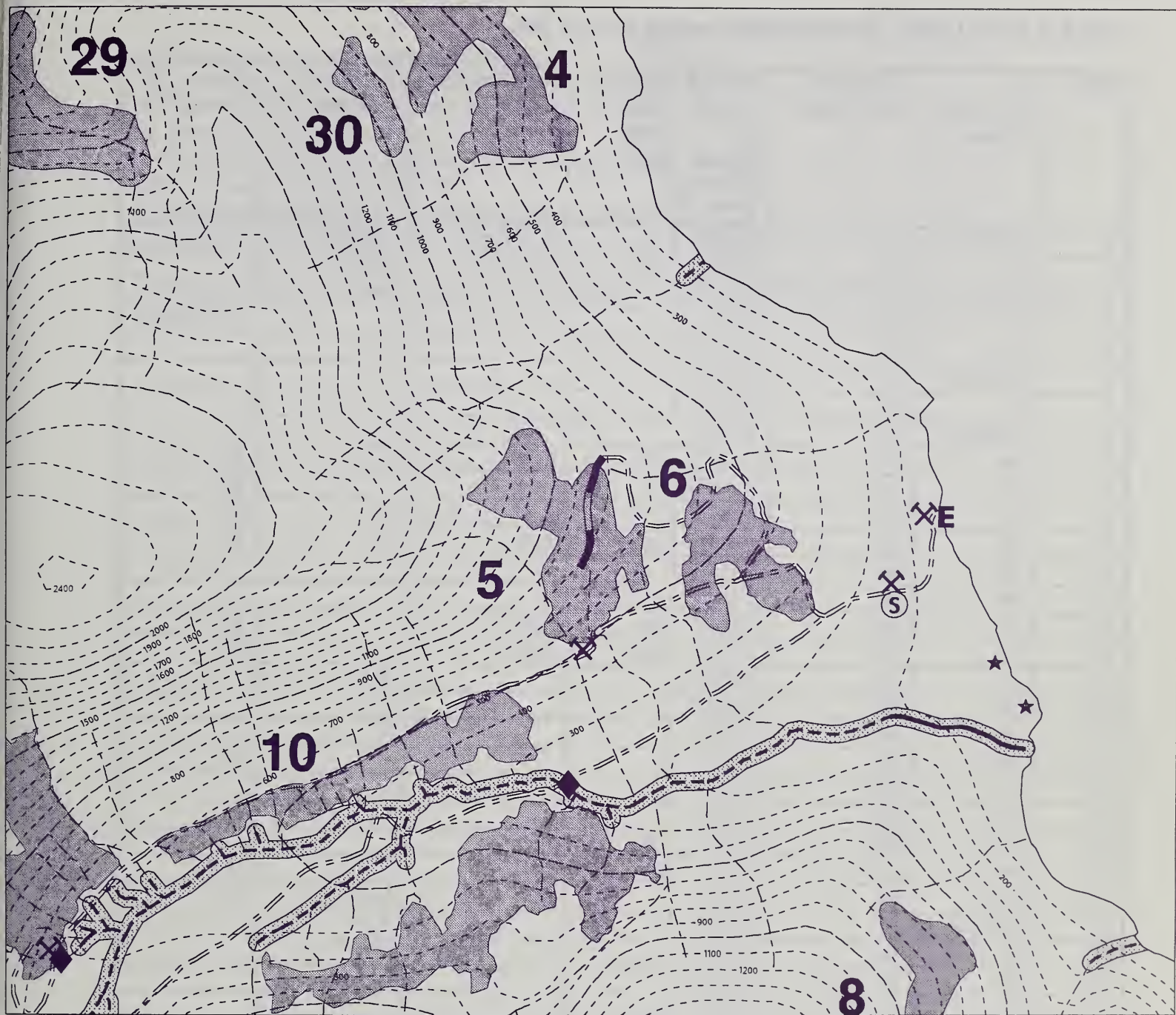















- |  |                                 |   |                                |
|--|---------------------------------|---|--------------------------------|
|  | Proposed Road Segment           |  | Proposed cut units             |
|  | Adjacent Proposed Road Segments |  | TTRA Buffers                   |
|  | Class 1 Streams                 |  | Saltwater and Lakes            |
|  | Class 2 Streams                 |  | Eagle Nest Tree                |
|  | Class 3 Streams                 |  | Proposed Log Transfer Facility |
|   | Proposed Major Stream Crossing  |  | Proposed Rock Pit Site         |
|  | Scale: 3 inches = 1 mile        |  | Proposed Sortyard Site         |

# KING GEORGE ROAD DESIGN CARDS

SEGMENT NO. 50			VCU: 462		
ROAD CLASS: TEMPORARY				SERVICE LEVEL: D	
ALTERNATIVE	1 & 6	2	3	4	5
OBJECTIVE LEVEL	N/A	N/A	N/A	Temporary	Temporary
LENGTH	N/A	N/A	N/A	1000 ft.	1000 ft.
# STREAM CROSSINGS - CLASS 1: -0			CLASS 2: -0		
Roads		Comments by: D. Barnett			
No comments.					
Timber /Silviculture		Comments by: R. Hojem/ J. Jordan			
Locate this segment to maximize cable yarding and allow for landing zones for helicopter yarding.					
Watershed/Fisheries		Comments by: J. Thompson/ D. Reed			
The distance to fish habitat is greater than 2000'.					
Soils/Geology		Comments by: J. deMontigny			
Consider obliterating temporary road by removing shot rock and re-using it elsewhere if compatible with operator's schedule or for future small sales. Reestablish native vegetation.					
Wildlife		Comments by: S. Posner			
Seeding temporary roads to native grass and forb species that are palatable to elk would be beneficial.					
Visual/Recreation		Comments by: M. Mitchell/ D. Galla			
This road segment is located on a bench to minimize views of this road from Zimovia travel corridor. Portions of this road segment will also be screened. If portions are seen, it will last until regeneration screens views. Seed with grass to prevent alder establishment along road. No recreational values.					
Access Management		Comments by: IDT			
This temporary road will be closed after harvest by removing drainage structures and restoring natural drainage patterns.					

# ROAD SEGMENT 50



- |  |                                 |   |                                |
|--|---------------------------------|---|--------------------------------|
|  | Proposed Road Segment           |  | Proposed cut units             |
|  | Adjacent Proposed Road Segments |  | TTRA Buffers                   |
|  | Class 1 Streams                 |  | Saltwater and Lakes            |
|  | Class 2 Streams                 |  | Eagle Nest Tree                |
|  | Class 3 Streams                 |  | Proposed Log Transfer Facility |
|   | Proposed Major Stream Crossing  |  | Proposed Rock Pit Site         |
| Scale: 3 inches = 1 mile   |                                 |  | Proposed Sortyard Site         |

**Table B-1, Water Quality and Fish Habitat Concerns for Each Unit.**

Unit #	In Freshwater System	Adjacent to Fish Habitat*	Number of Class III Streams "b" and "c"***	Contains Slopes Over 67%	Mitigation for Unstable Slopes***	Wetland Mitigation***	Risk Rating****
1	partially	no	0 and 5	yes	UM, R, H	UM, H	
2	no	no	3 and 2	yes	UM, R, H	UM, H	
3	no	no	0 and 0			UM	
4	no	no	0 and 1				
5	yes	no	0 and 3			C	
6	partially	no	0 and 0				
7	no	no	0 and 1				
8	partially	no	0 and 1				
9	yes	yes	2 and 4	yes	R, H	R, H	H
10	yes	yes	2 and 10				M
13	yes	yes	2 and 5	yes	R, H	O	H
14	yes	yes	1 and 6	yes	R, H	O	H
15	yes	no	0 and 2			C	
16	no	no	0 and 1				
17	yes	yes	3 and 4	yes	R, H		M
18	yes	yes	3 and 6	yes	R, H, T		H
19	yes	no	2 and 0			R, H	
20	yes	yes	0 and 0			S	
21	yes	no	1 and 0			C	
22	yes	yes	3 and 5				M
23	yes	yes	0 and 1				
24	yes	yes	0 and 1				
25	yes	yes	0 and 0	yes	R, H		
26	yes	yes	1 and 5	yes	R, H		H
27	yes	no	0 and 1			R, H	
28	partially	no	0 and 2			R, H	
29	no	no	2 and 0			UM	
30	no	no	0 and 0				
31	no	no	0 and 0				
32	partially	no	0 and 1				

LEGEND for Table B-1

\* We designed units adjacent to fish streams with a no-harvest buffer of at least 100 feet measured horizontally from the streambank. These streams are protected according to contract provision "a" which specifies that "timber harvest units shall not be within a minimum buffer zone of 100 feet on either side of Class I streams and Class II streams which flow directly into Class I streams."

\*\*Class III streams are protected according to contract provisions "b" or "c". The "b" provision requires that "trees shall be felled...away from streamcourses" and "trees or products shall not be hauled or yarded across streamcourses unless fully suspended. Debris in streamcourses resulting from falling or yarding...shall be removed immediately..." The "c" provision requires that "insofar as practical, trees shall be felled and yarded away from streamcourses..." and that "Debris...shall be removed...before the yarder leaves the unit or upon completion of seasonal logging activities in the unit..." Deeply incised or unstable streams usually receive "b" protection. Shallowly incised streams with less capacity for sediment transport usually receive "c" protection.

LEGEND for Table B-1 (continued)

\*\*\*Mitigation measures include the following:

UM area within unit unmanaged or excluded from harvest

R harvest prescription retains some trees

H helicopter yarding prescribed

T temporary road location modified to avoid unstable slopes

C cable yarding (instead of shovel)

O potential road obliteration by removing shot rock after road use

S cable yarding with suspension prescribed

\*\*\*\*Relative risk of sediment transport to aquatic habitat. Only highest (H) and moderate (M) risk units are indicated.

**Table B-2, Water Quality and Fish Habitat Concerns by Road Segment.**

Road Segment #	Length Within Freshwater System (feet)*	Number of Fish Habitat Crossings	Number of Other Critical Stream Crossings**	Other Concerns***	Mitigation****	Risk Rating*****
1	0	0	0			L
2	14000	1	0	AF	D, L	M
3	400	0	0	W	X	L
4	6835	1	2	Z	D, L, F	H
5	2600	0	0	Z	L, F	L
6	3960	0	0	W	X	L
7	5280	0	1	W	D, L, X	H
8	12870	1	1	Z, S	D, L, F, EC	H
9	12998	3	0	W	X	M
13	1000	0	1	W, AF	L, O	M
14	1100	0	0	W	L, O	L
17	1980	0	0	W	O	L
50	0	0	0		L, O	L

LEGEND for Table B-2

\*Approximate length

\*\*Includes large streams or v-notches with evidence of high debris and bedload transport.

\*\*\*Other concerns include:

AF road crosses small alluvial fans  
W road crosses wetland  
Z road crosses oversteepened slope  
S road crosses sand deposit

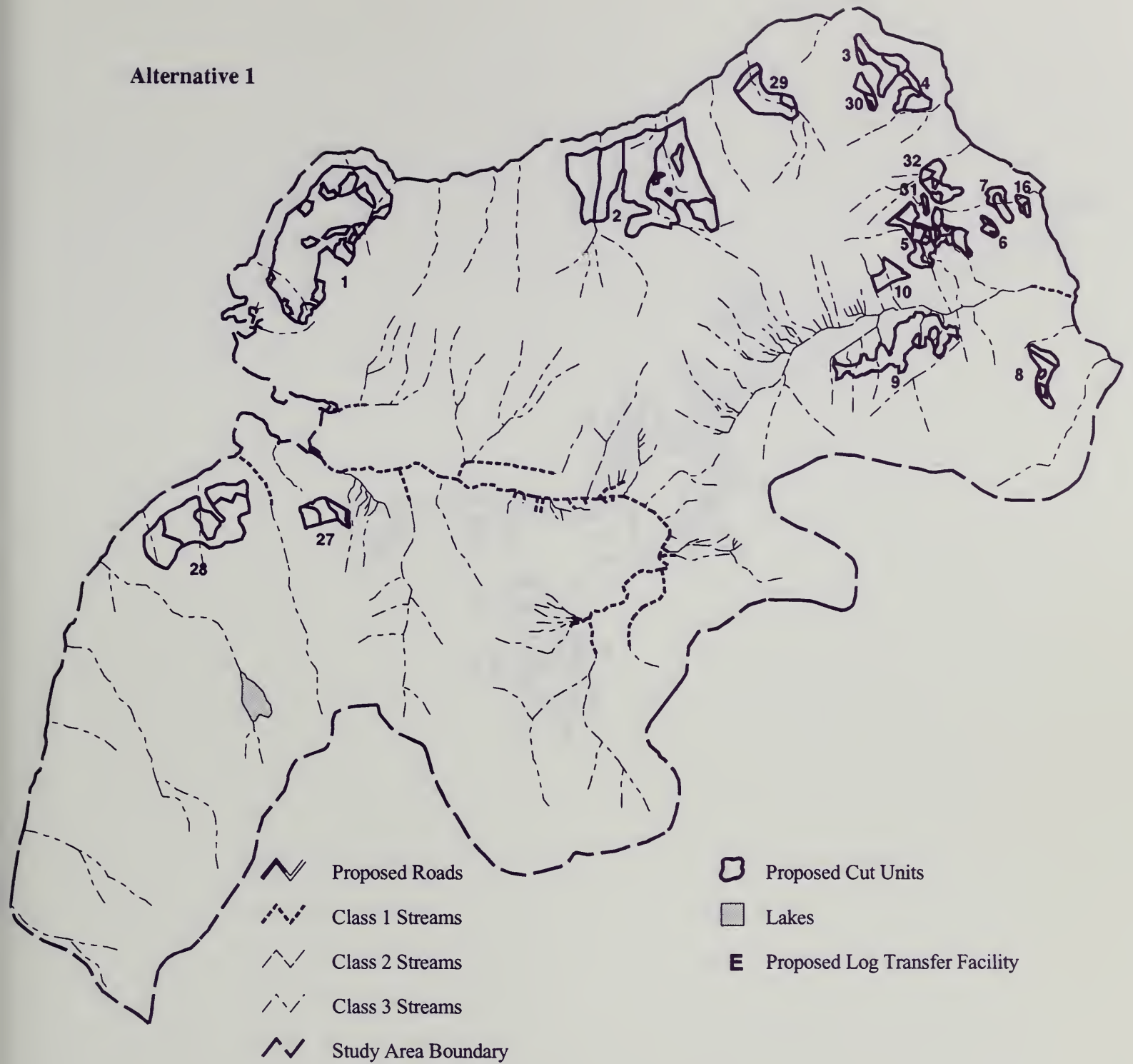
\*\*\*\*Mitigation includes:

D stream crossing structures designed to accommodate high bedloads (and/or temporary)  
X extra cross drains to minimize diversion of subsurface flow through wetlands.  
F full bench cut with end haul of excavated material requires site-specific design  
EC encounter with sand deposit will require immediate erosion control measures  
L road located to minimize habitat crossings or avoid unstable slopes  
O potential opportunity to remove shot rock after road is used (all temporary roads will have drainage structures removed)

\*\*\*\*\*Relative risk of sediment transport to aquatic habitat. Only highest (H) and moderate (M) risk units are indicated.

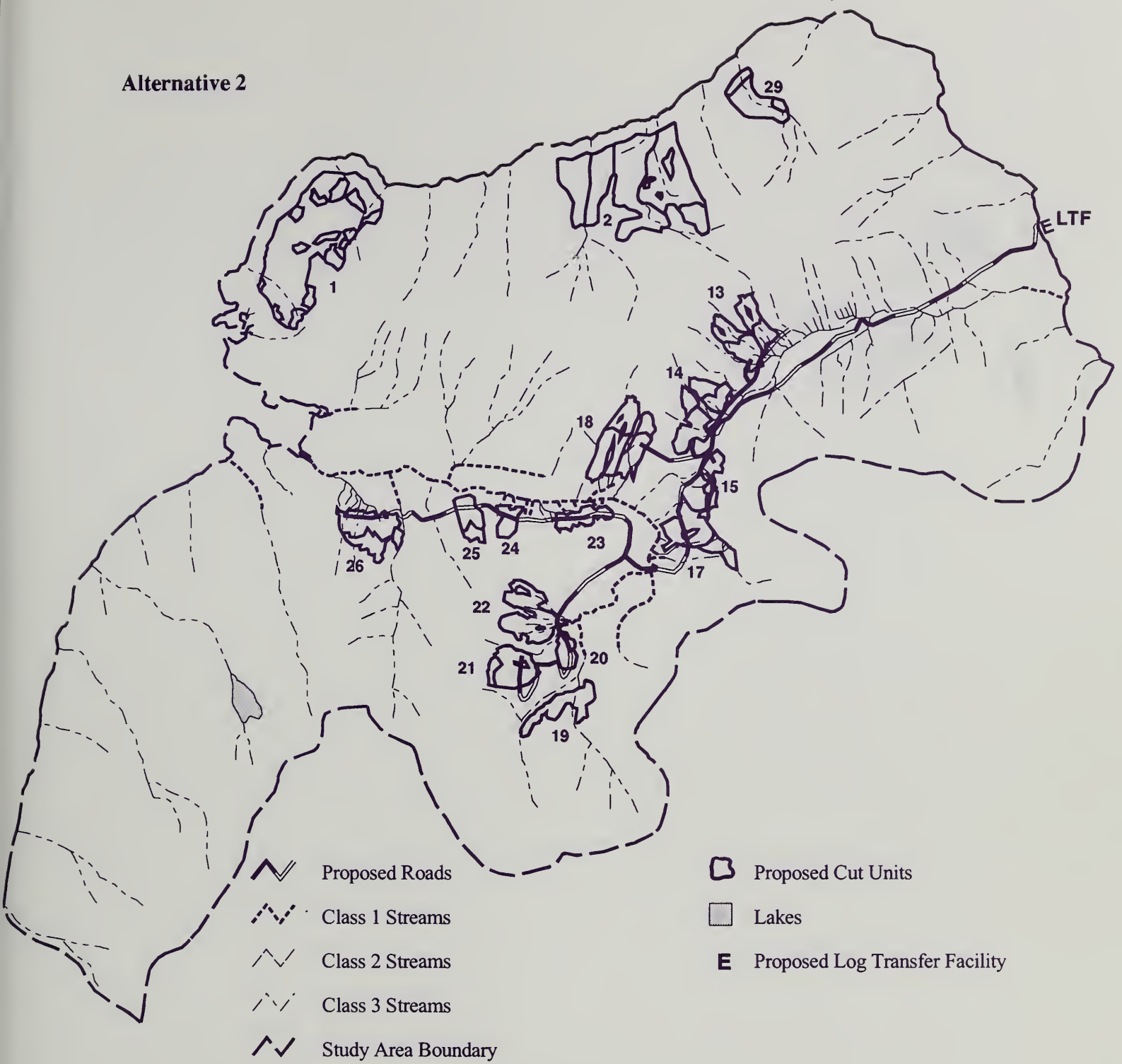
Road segments 13, 14, 17, and 50 are temporary roads.

## Alternative 1





## Alternative 2

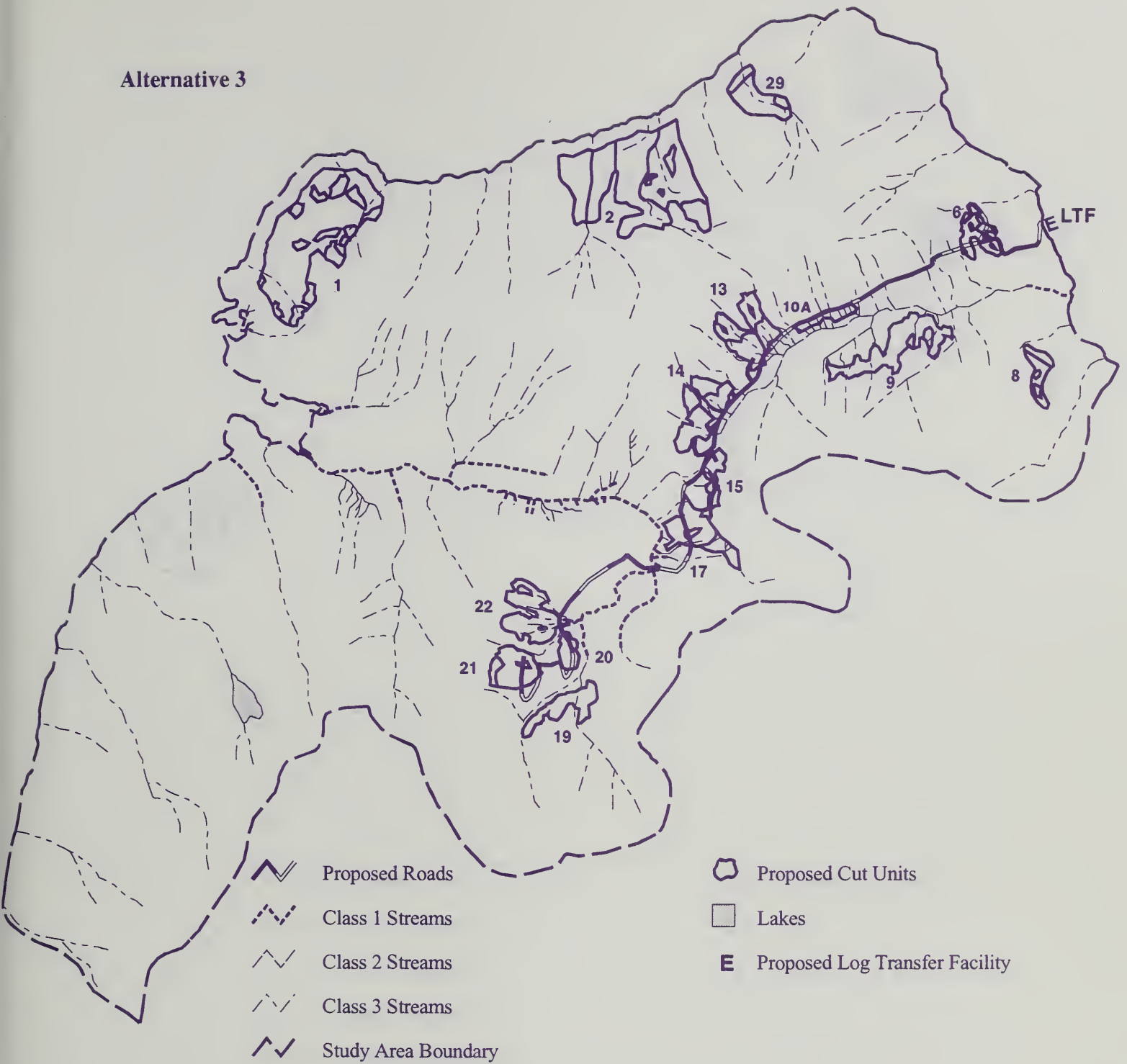




THE  
LAND  
OWNERS

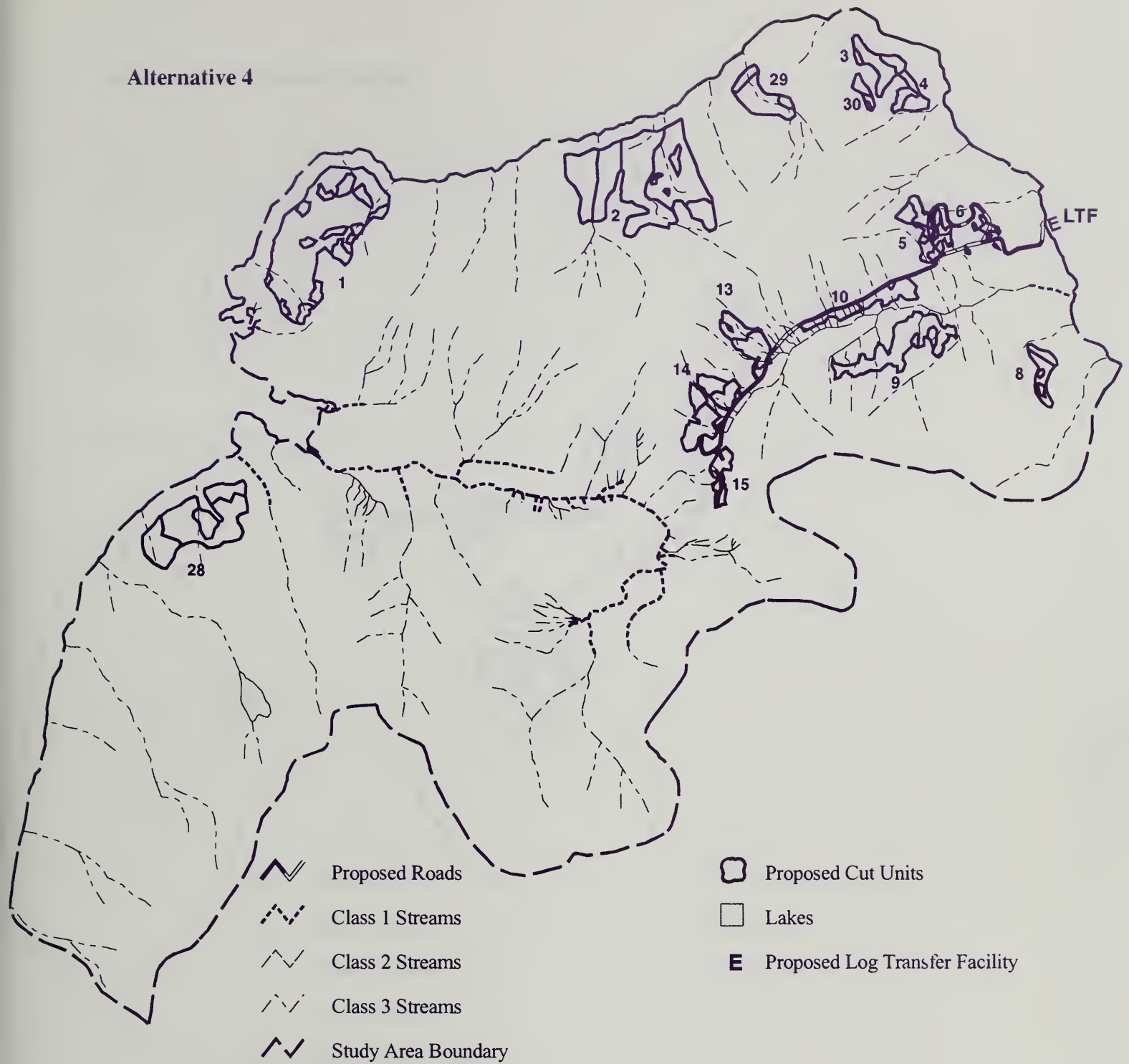
THE  
LAND  
OWNERS

# Alternative 3



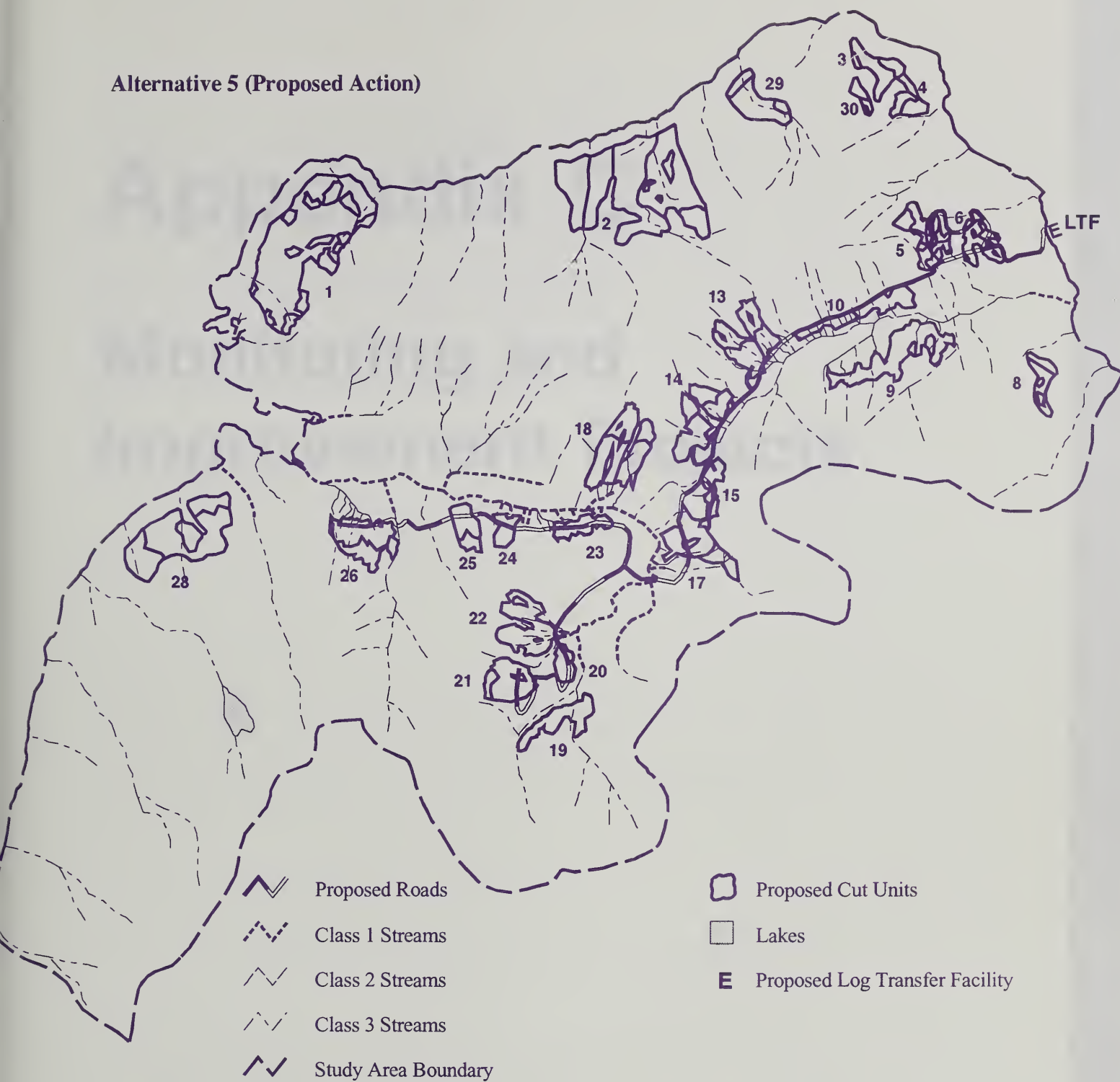


## Alternative 4





# Alternative 5 (Proposed Action)





# **Appendix C**

## **Monitoring and Improvement Projects**

# Appendix C

Monitoring and  
Improvement History

# Appendix C

## Monitoring and Improvement Projects

### Monitoring Plan

#### Log Transfer Facility

**Objective:** Determine permit compliance according to permit requirements.

**Method:** SCUBA divers run transects and record depth and areal extent of bark accumulation once before and annually during logging activities.

**Action:** Notify EPA if bark deposition encompasses 100% coverage of an area one acre or larger in which the depth of bark exceeds ten centimeters at any point in that area.

EPA may require removal of bark.

**Cost:** \$1,000

#### Best Management Practice Implementation

**Objective:** Evaluate application of BMPs for water quality and fish habitat protection.

**Method:** Follow Alaska Region BMP implementation monitoring protocols. Randomly select completed roads and units with high priority assigned to sites with high risk in Appendix B tables.

**Action:** If protection is inadequate, apply corrective measures. If protection measures are inadequate or unsuitable, modify future recommendations.

**Cost:** \$1000

#### Best Management Practice Effectiveness

**Objective:** Address priorities indicated in Tongass National Forest effectiveness monitoring strategy. Monitoring sites may or may not be selected within the King George study area.

**Action:** If protection is inadequate, modify BMP.

**Cost:** Variable

## **C - Monitoring and Improvement Projects**

### **Predicted Timber Volume**

**Objective:** Determine if harvest prescriptions achieved predicted timber volume.

**Method:** Prior to harvest, compare cruise volumes of various units with anticipated volumes based on prescription assumptions. During harvest, work with timber purchaser to obtain volume information under lump sum sale. If scaled sale, check harvest records as units are logged. After harvest, several cruise plots could be relocated to determine the volume remaining. The district monitoring team would be responsible for implementing, if funding allows.

**Action:** Refine estimates for future sales.

**Cost:** \$2000

### **Scenic Resources**

**Objective:** Determine if harvest prescriptions were implemented and effective in meeting the visual quality objectives. Determine how close resulting harvest is to scenic thresholds identified in the desired condition analysis (Appendix A) and Forest Plan.

**Method:** Two landscape architects will independently evaluate harvest implementation and effectiveness two years following harvest. Use before and after photos in addition to site visits. Information will validate threshold values.

**Action:** Produce a chart showing the number of acres treated, the prescription and the result. The information, organized by viewshed and land unit, will help determine proximity to threshold values, and could be used in future projects proposed in similar Scenic Viewsheds.

**Cost:** \$2000

### **Sensitive Plants**

**Objective:** Determine the extent and impact of off-road traffic on sensitive plants.

**Method:** Field investigations will be done to determine if off-road use is occurring in the areas where sensitive plants have been located. The amount of impact will be assessed using ocular estimates.

**Action:** If impacts are occurring, a change in access management will be considered.

**Cost:** \$200 annually

### **Wildlife Harvest**

**Objective:** Determine if changes in harvest of big game and furbearers are consistent with predictions in the King George FEIS subsistence report. Harvest rates are important in assessing whether the supply of game is adequate to meet demand by subsistence hunters.

**Method:** Annually review ADF&G harvest data to determine subsistence versus non-subsistence harvest and changes in the rate of harvest over time.

**Action:** If non-subsistence harvest or increasing total harvest trends indicate that future populations may be insufficient to meet subsistence demand, assess hunting regulations and travel management (road access) to determine needed changes.

**Cost:** \$350 per year

## C - Monitoring and Improvement Projects

### Blowdown

**Objective:** To determine if there is any blowdown after the sale has been logged in the harvest units and buffer strips. If so, is there a greater amount of blowdown related to a particular harvest prescription or location.

**Method:** The method of determining if there has been blowdown within the sale area will be by aerial flight over the area, followed up by ground reconnaissance.

**Action:** The action taken if blowdown occurs will be to evaluate the possibility of a salvage sale and revise future prescriptions.

**Costs:** Approximately \$1,000.

### Regeneration

**Objective:** To determine if there is adequate natural stocking within each unit four years after timber harvest.

**Method:** The method of determining stocking will be field exams of each unit harvested.

**Action:** If adequate stocking is not present within any harvest unit, it will be planted to bring stocking up to at least 300 trees per acre.

**Costs:** \$15,000-\$35,000 depending on the alternative selected.

### Prescription Accomplishment

**Objective:** To determine if timber sale prescriptions met the objectives of other resources after harvest.

**Method:** To determine if this objective has been met, IDT members will do a field review of selected units and discuss the results.

**Action:** The results of the field review will help to revise future prescriptions.

**Costs:** Approximately \$ 5,000.

### Forest Health

**Objective:** To determine what the health of future timber stands will be following a partial harvest prescription.

**Method:** Field exams will be done to determine the extent of porcupine damage, black-headed budworm outbreak, and heart rot on residual and newly regenerated trees. These field exams will be done in the fourth year after harvest as part of the natural regeneration exams, and in the fifteenth year after harvest as a timber stand improvement exam to determine precommercial thinning needs.

**Action:** The action taken may be the prevention of further spread of the disease organism.

**Costs:** Included in regeneration exams

### Marine Slash

**Objective:** To determine if the amount of slash escaping from the processing barge poses a hazard to navigation or creates problems for sport and commercial fishermen in the vicinity of the helicopter drop zones.

**Method:** Have the timber sale administrators and operators watch for floating slash and require the operator to retrieve it. Request comments from fishermen and boat operators in the area.

**Action:** The contract will require slash containment and pick-up by the operator.

**Cost:** \$1,000

## C - Monitoring and Improvement Projects

### Potential Improvement Projects

If an action alternative is selected these projects may be listed in the King George Timber Sale Area Improvement Plan. All projects comply with Forest Service KV Handbook direction (FSH 2409.19). KV funding for projects other than regeneration surveys and tree planting would be dependent on the amount of sale revenues. The following projects are not listed in order of KV funding priority.

**Natural regeneration surveys-** These surveys will be done on each harvest unit to determine if the units are stocked within 5 years after harvest.

**Tree planting-** Harvest units that are not adequately stocked within 5 years after harvest will be planted to increase stocking. Units may also be planted to increase the species diversity of yellow-cedar, redcedar and Sitka spruce.

**Porcupine damage surveys-** Porcupine surveys may be done in conjunction with natural regeneration surveys to determine extent of damage to residual trees. Porcupine control may need to be implemented to reduce damage to sapling and pole size trees.

**Fish enhancement-** Blasting may be done to enhance jump pools for coho, which could improve the future productivity of the King George fishery.

**Kunk drainage easement-** Logging slash may be removed from the end of the spur road into unit 17 for a width of about 5 feet to enhance the access into the Kunk Lake drainage.

**Slash treatment-** Logging slash may be removed, by burning or chipping, from landings along the main specified road that might be built from Honeymoon Creek into King George Creek to reduce the visual impact of large landing slash piles from the Zimovia and Bessie Peak views. This can also reduce the amount of productive forest land that is covered by slash and unavailable for growing sites.

# **Appendix D**

## **LTF Site Selection, Design, and Marine Effects**

## D - LTF Site Selection, Design, and Marine Effects

Sites A and B both have minimal protection from winter storm wave action, although wave impact on the beach appears minor.

Site A is located 3/4 mile north of the mouth of Honeymoon Creek, at the southern edge of an existing managed stand. The road approach to this site would require approximately 150 feet of full bench rock cut at a 15% grade to reach the water. Visually, this site will be difficult to screen from Zimovia Strait, homes located between 8 mile and McCormack Creek, and the Wrangell road system. In addition, a small intermittent stream flows through this site.

Site B is located 1/2 mile north of the mouth of Honeymoon Creek. The approach is much more gentle with 30% side slopes and 6% grade. This site would have the best potential for visual screening. Development of a facility at this site could be accomplished with the least amount of ground disturbance on the beachfront, of all sites considered. The proximity to the mouth of Honeymoon creek does pose a potential conflict with the crab fishery in the area. In addition, there have been reports of herring spawning in the general area, although this has not been officially documented by ADFG. Because Site B appeared to be the most accessible with the least amount of disturbance it was chosen for more detailed analysis and preliminary design work. The LTF will be described as Zimovia Strait LTF.

Log transfer facility impacts usually include 1) loss of habitat to fill, 2) leaching of toxic soluble substances from subtidal or upland woodwaste deposits, and 3) degradation or smothering of benthic habitat and organisms. These effects can be mitigated in large part through site selection, design and construction measures, and operating guidelines.

### Siting Guidelines

The Alaska Timber Task Force, an interagency/industry group, developed the following siting guidelines for log transfer facilities in southeast Alaska. Sites should attempt to meet the best mix of guidelines, although it is recognized that not all sites can meet all guidelines.

**The site should be at least 300 feet away from the mouths of Class I fish streams or important fish spawning and rearing areas.**

The Zimovia Strait LTF site is about 2600 feet from the nearest Class I stream (Honeymoon Creek). Detailed field reconnaissance of the area did not detect fish spawning or rearing areas nearer than Honeymoon Creek either north or south of the LTF site.

**The site should be protected from weather, suitable for anchoring, and with at least 20 acres for temporary log storage and booming.**

The adjacent marine waters are not well protected for building or storing log rafts. Only temporary raft storage could be provided dependent on weather. Operators could store rafts at East Point off Woronkofski Island (4 miles north), at the APC Shoemaker Bay mill site (5 miles northeast) or at the Pat Creek LTF site on Wrangell Island (2.5 miles east).

**The site should be near at least five acres of relatively flat uplands.**

The selected site requires minimal road construction to connect with the mainline road system in all roaded alternatives. A sort yard will be constructed about 800 feet up the road with better opportunities for erosion control and runoff detention away from marine waters.

## **D - LTF Site Selection, Design, and Marine Effects**

**The access road should maintain a grade of 10% or less.**

The access road can be constructed at a 10 - 15% grade.

**The site should be adjacent to strong tidal currents to disperse sunken or floating wood debris.**

The site has a northeastern exposure on Zimovia Strait with fair tidal flushing. The divers' general conclusion was that the site only marginally met bark dispersal guidelines but its exposure in close proximity to deeper waters may facilitate dispersal during seasonal storms. The tidal patterns at this site may be more likely to disperse material during use and construction than Site A.

**Sites should be located in the least productive intertidal and subtidal zones.**

Although the site is near the Honeymoon estuary it does not exhibit geomorphic or biologic characteristics of highly productive estuarine wetlands. The contract divers found abundant skate egg cases but only sparse and small populations of bay scallops and Dungeness crab in the vicinity in 1992. The IDTeam noted that most commercial crab pots appear to be well south of the site (on the south side of Honeymoon Creek). Nevertheless, the potential effects of runoff, bark accumulation, leachates, and logging slash near the LTF is a concern to be addressed through design and operating guidelines. The location of the sort yard away from marine waters will minimize runoff potentially transporting sediment, petroleum products, or other deleterious substances into these zones.

**Sites should not be near sensitive habitat or shellfish concentration areas.**

Divers noted that the uniformity of the intertidal and subtidal zones in the surrounding area would be favorable for recolonization of displaced or affected organisms. They did not note sensitive habitat or shellfish concentrations.

**Sites should be safely accessible to tug boats with rafts under most conditions.**

There appear to be no navigational hazards in the area.

**Sites should be located where log rafts will not ground at low tide.**

The low angle ramp is designed to work with the tide. Proper boom placement will prevent grounding. As previously mentioned, the site is not well protected for raft storage.

**Sites should avoid bald eagle nests.**

The nearest documented bald eagle nests are about 1/2 mile south of the site.

**Additional consideration should be given to the following:**

**Sites should accommodate future logging operations.**

The LTF design will accommodate both large and small operators. It is a low angle slide that requires minimal equipment to transfer bundled logs from trucks to the water for rafting.

**Sites should avoid areas with established commercial, subsistence, and sport fishing activity, high levels of recreation use, high scenic quality, or documented concentrations of species commonly pursued by fishermen.**

Because the site is close to Wrangell and near an established commercial crab fishery, conflicts with recreational boaters, commercial fishermen, and scenic qualities remain a

## **D - LTF Site Selection, Design, and Marine Effects**

concern. Visual screening of the site was an important consideration in designing the facility.

### **Design and Construction Measures**

Chapter 3 describes some of the special design features intended to minimize visual impacts of the LTF. The LTF has been designed to limit fill to 0.2 acres of intertidal and subtidal area. The LTF card displays erosion and sediment control features designed to mitigate the concern for pollutants entering marine waters.

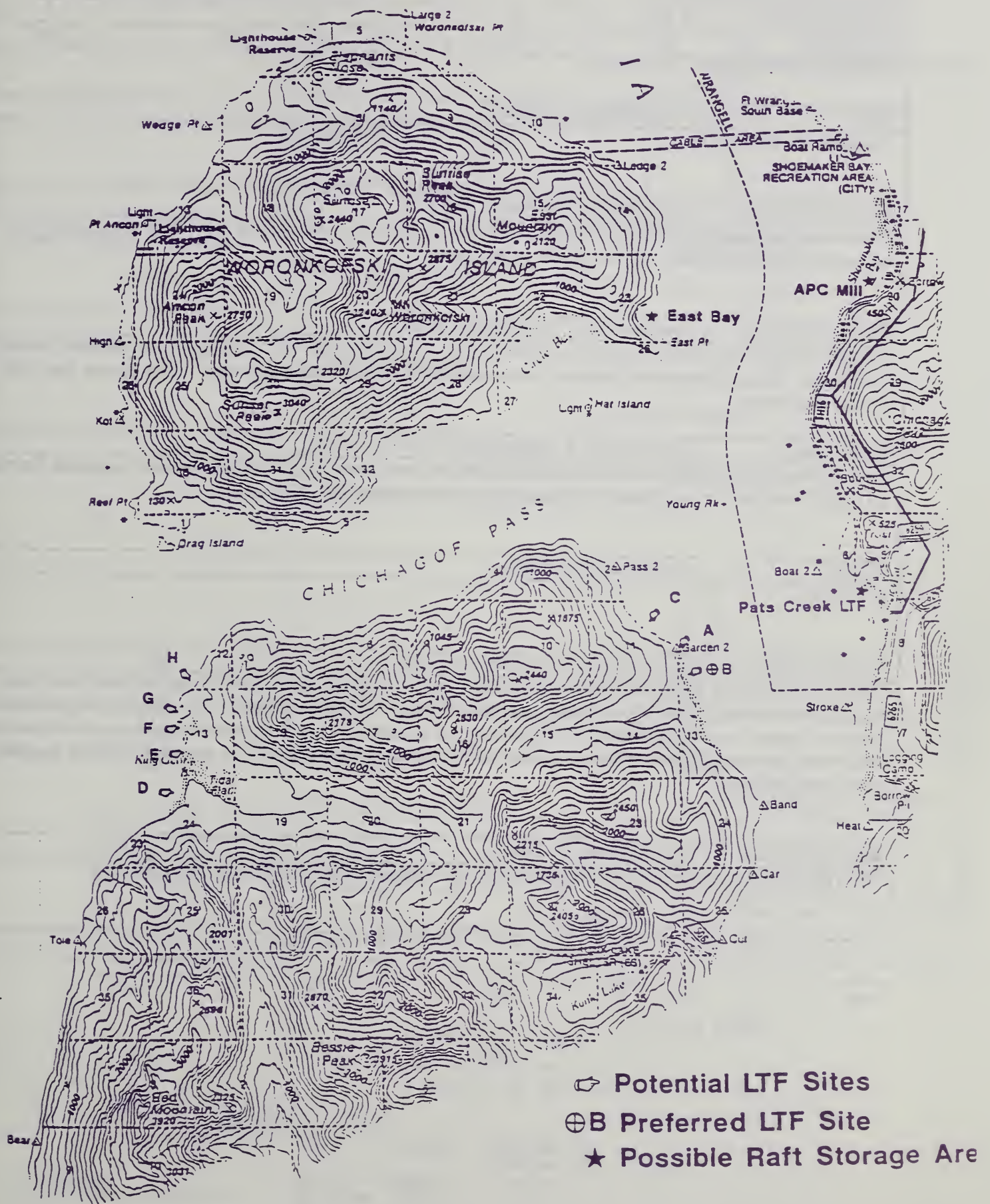
### **Operating Guidelines**

Although flushing is a desirable site feature, loss of floating or near-submerged debris from this site may be a concern for recreational boaters and commercial fishermen. The use of log booms will contain most of this debris. The contract administrator will ensure that the operator is aware of this concern. The contract will include provisions to ensure that the operator minimizes the amount of loose floating slash in the area. The monitoring plan (Appendix C) also addresses this concern. The contract may also require a timing clause to minimize conflicts with fishing.

We anticipate that the LTF permit will require a pollution prevention plan describing routine maintenance and monitoring of pollution control measures. A special BMP requires regular LTF cleanup during operations. We also anticipate that the LTF permit will require a monitoring dive to determine the depth and extent of bark accumulation each year of operation.

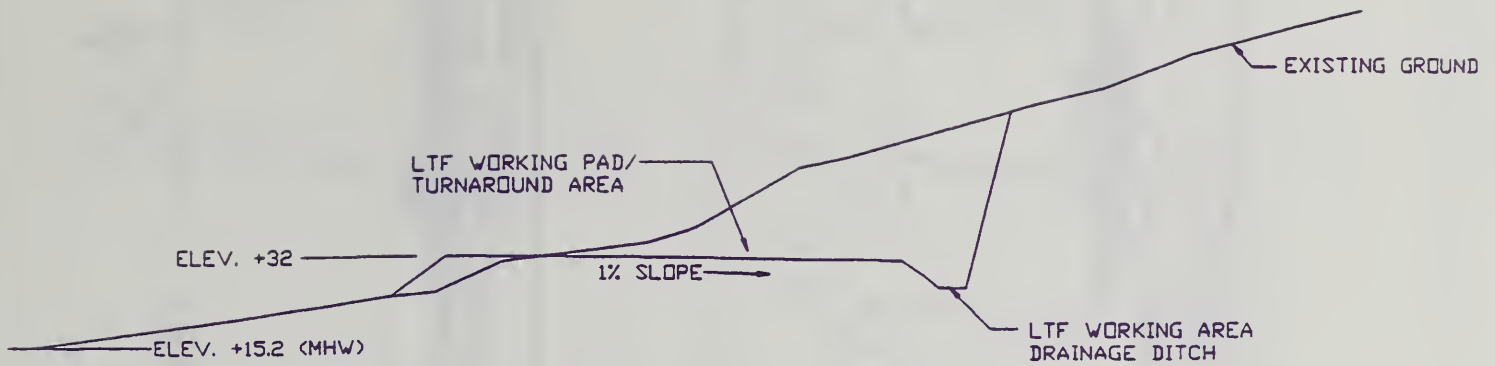
# D - LTF Site Selection, Design, and Marine Effects

Figure D-1: LTF Sites and Raft Storage Areas

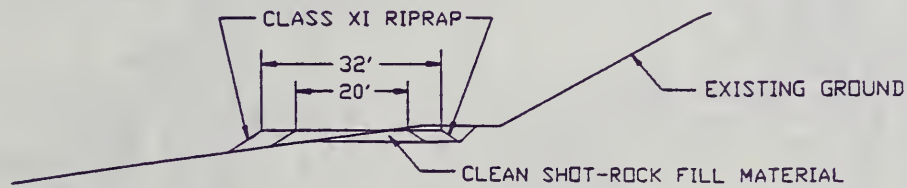


# KING GEORGE LTF DESIGN CARD

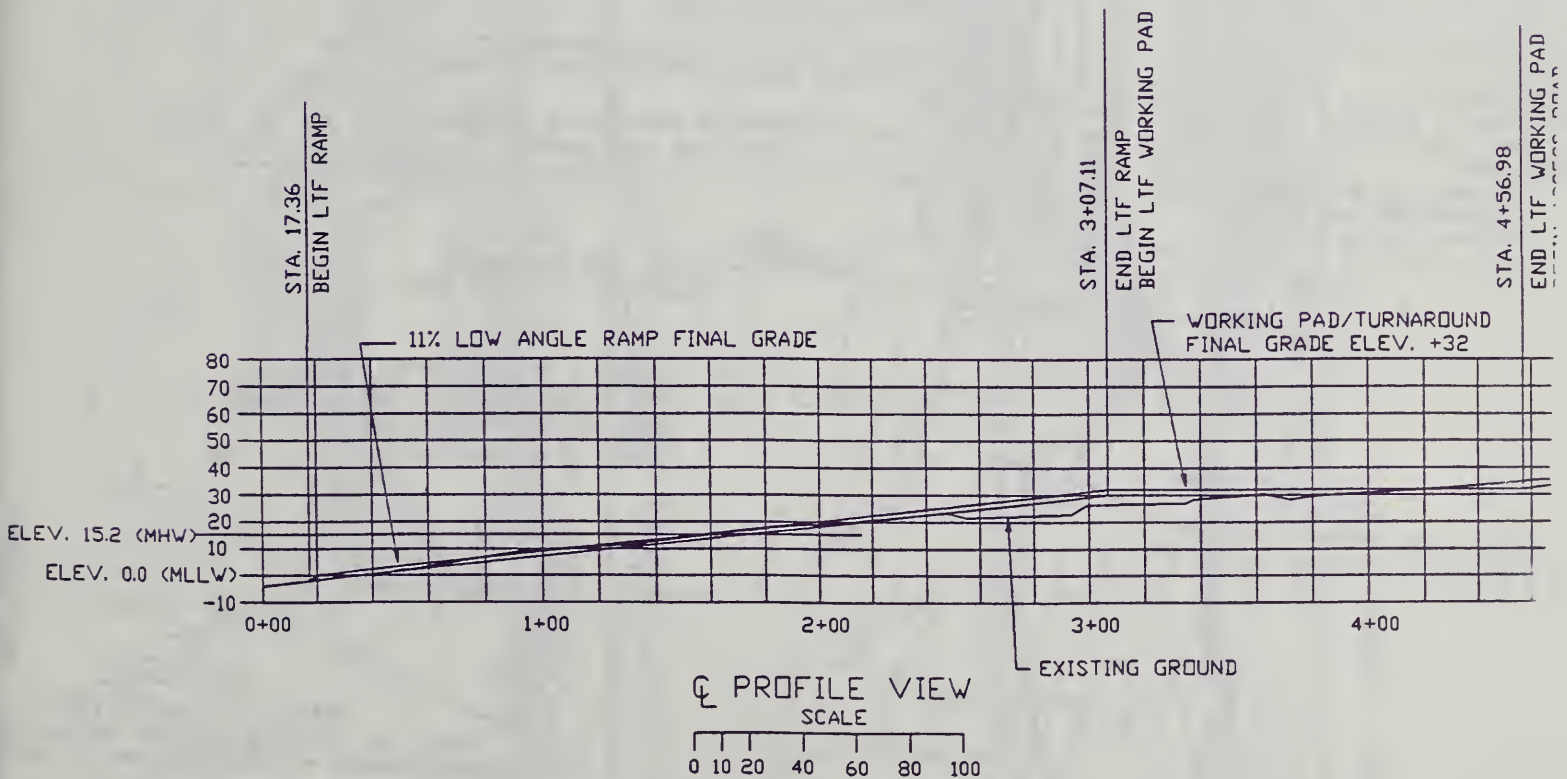
SEGMENT NO. LTF				VCU: 462	
ROAD CLASS: COLLECTOR				SERVICE LEVEL: C	
ALTERNATIVE	1 & 6	2	3	4	5
DEVELOPED	No	Yes	Yes	Yes	Yes
# STREAM CROSSINGS - CLASS 1: -0			CLASS 2: -0		
Roads		Comments by: D. Barnett			
No comments at this time.					
Timber /Silviculture		Comments by: R. Hojem/ J. Jordan			
Allow room for parking 2-5 transport vehicles on the south edge of the LTF working area. Keep size of LTF to a minimum while still allowing efficient transfer of log bundles.					
Watershed/Fisheries		Comments by: J. Thompson/ D. Reed			
LTF plan displays site specific application of BMP's 14.4, 12.17, 14.8, and 14.27 for erosion and sediment control and revegetation. Ensure that these measures are incorporated into pollution prevention plan. Site is greater than 2600' from a class I fish stream.					
Soils/Geology		Comments by: J. deMontigny			
Prevent sediment and logging debris from entering estuarine environment by placing structures or vegetation filter along the edge of working surface. Ensure soil placement is above highest tide level.					
Wildlife		Comments by: S. Posner			
No concern.					
Visual/Recreation		Comments by: M. Mitchell/ D. Galla			
Visible from Wrangell Island and Zimovia Strait travelways. Provides access to road system and entire study area. Protect buffer around LTF with pre-splitting controlled blasting. Minimize clearing widths to the extent practicable. In particular, protect forest screen between LTF and water on southern 1/2 of site by considering the use of blasting mats to achieve this protection. Ensure minimum clearing of this buffer keeping it as wide as possible. Establish vegetative cover along bulkhead.					
Sale Administration		Comments by: T. Gunn			
When applying for permits for log rafting area, allow for adequate room. 500' x 1000' recommended.					



TYPICAL LTF WORKING PAD CROSS SECTION



TYPICAL RAMP CROSS SECTION

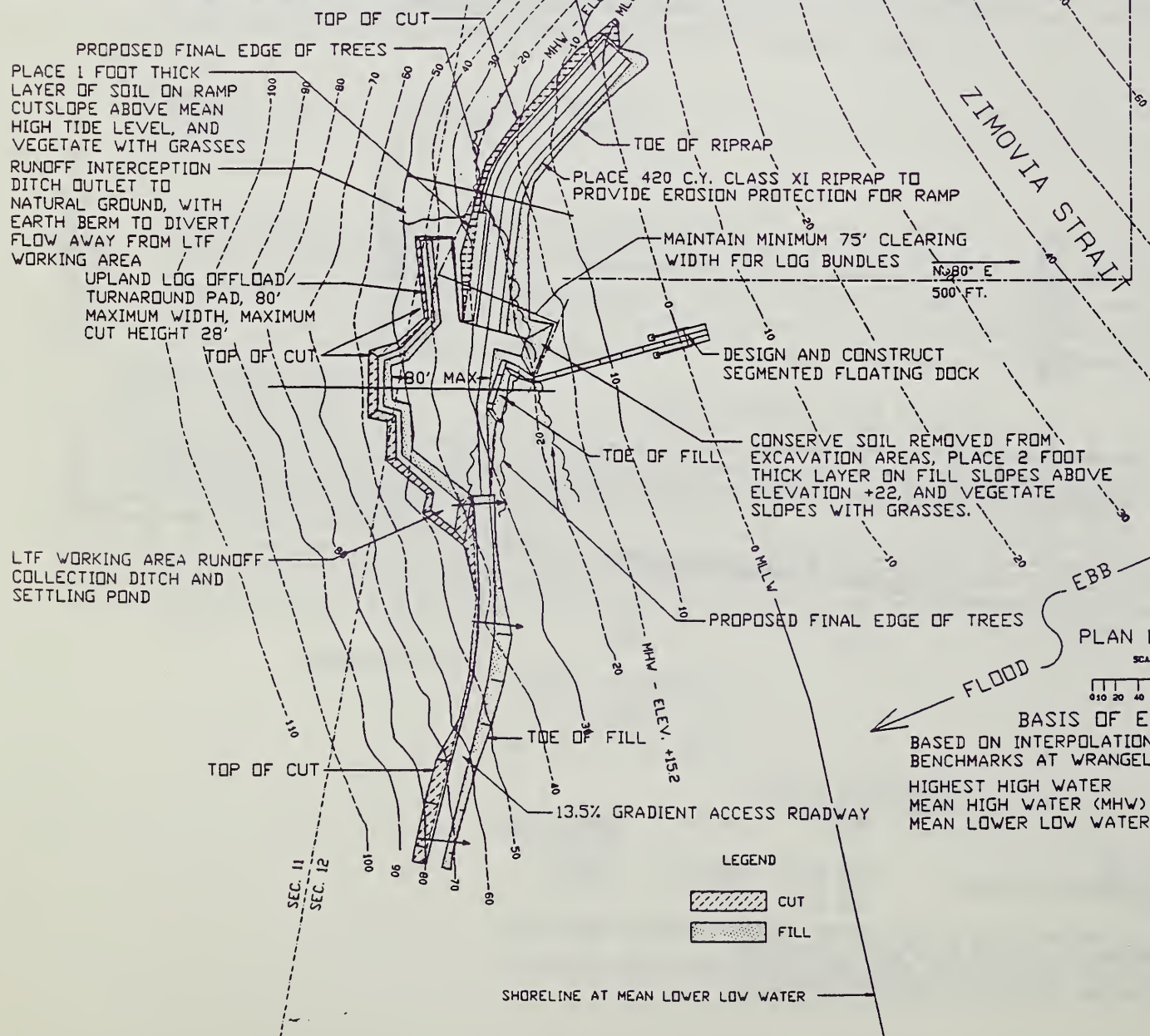


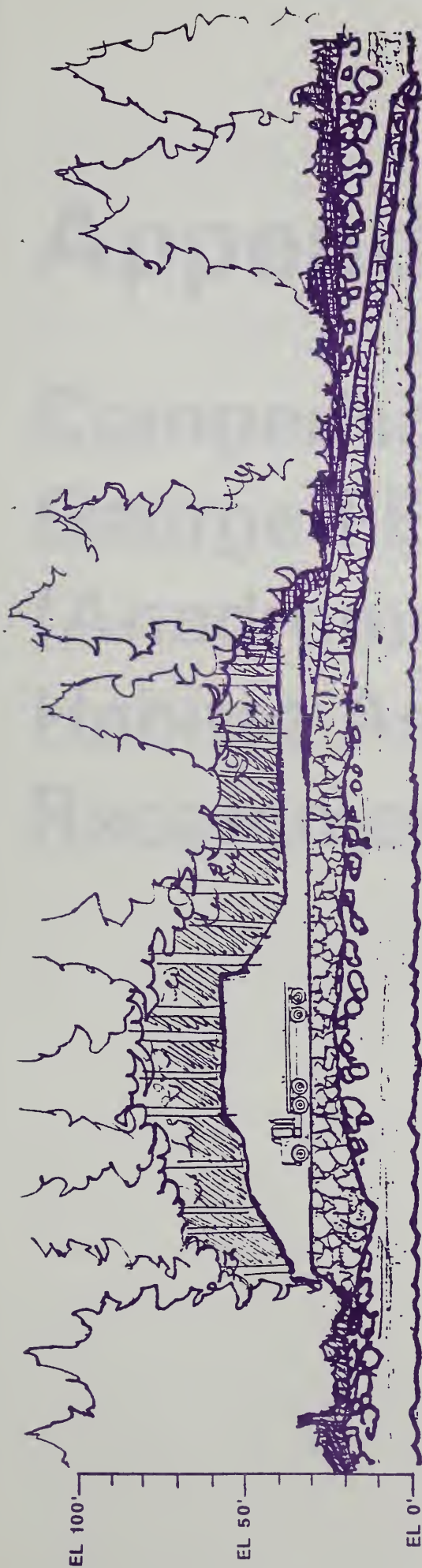
### QUANTITIES

	RAMP	LTF PAD	ROADWAY (TO STATION 7+95)
EXCAVATION	728 C.Y.*	6,626 C.Y.	472 C.Y.
FILL (BORROW EXCAVATION)	637 C.Y.**	726 C.Y.	673 C.Y.
RIPRAP	420 C.Y.		

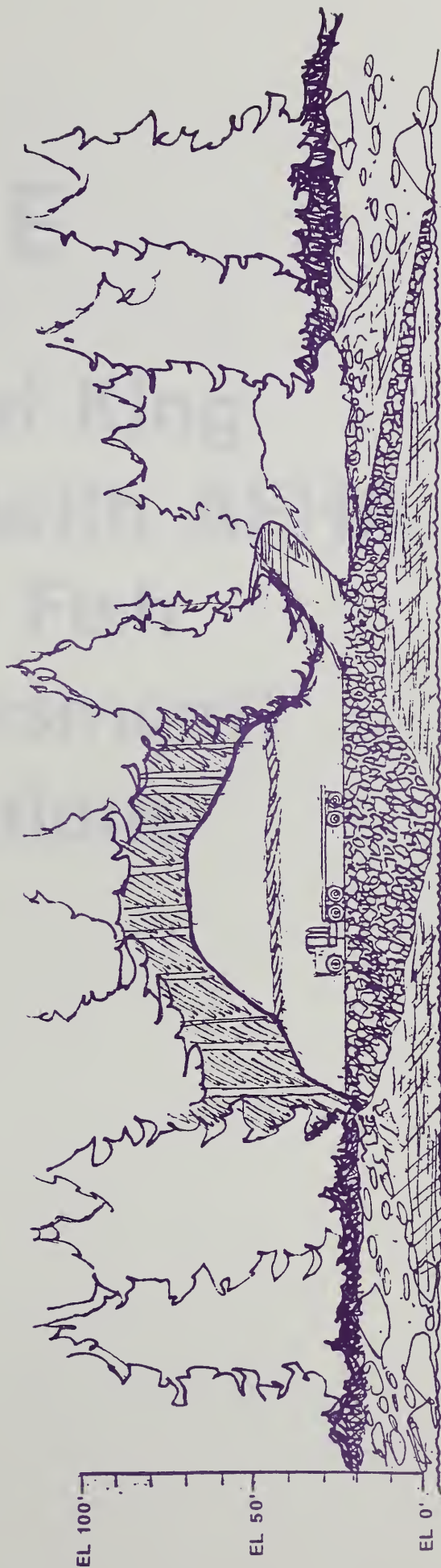
- \* 414 C.Y. OF THIS IS UNSUITABLE BEACH SEDIMENT MATERIAL BELOW MHW; REMAINDER OF VOLUME IS UPLAND EXCAVATION.
- \*\* 392 C.Y. OF THIS IS CLEAN SHOT ROCK PLACED BELOW MHW; REMAINDER OF VOLUME IS UPLAND EMBANKMENT PLACEMENT.

PROPOSED 11% DRIVE-DOWN SHOT-ROCK LTF RAMP, CONSTRUCT RAMP WITH OVERALL DIMENSIONS TO TOP OF RAMP AT ELEV. +32 (TOE OF RIPRAP TO TOP OF CUT) 48 FT. WIDE, 295 FT. LONG, AND DRIVING SURFACE DIMENSIONS 20 FT. WIDE BY 289 FT. LONG. CONSTRUCTION WORK IN THE INTERTIDAL/SUBTIDAL ZONE (BELOW MEAN HIGH TIDE) INCLUDES EXCAVATING AND WASTING ON UPLANDS 414 C.Y. UNSUITABLE BEACH SEDIMENTS, AND PLACING 392 C.Y. CLEAN SHOT ROCK TO COMPLETE 148 FT. INTERTIDAL LENGTH OF RAMP. TOTAL INTERTIDAL/SUBTIDAL (BELOW MEAN HIGH TIDE) IMPACT AREA OF 0.16 ACRES.





ZIMOVIA/KING GEORGE LTF



EARL WEST LTF



# **Appendix E**

## **Comparison of King George FEIS with AFHA (Anadromous Fish Habitat Assessment) Recommendations**

# Appendix E

Comparison of King  
George FELS with AFHA  
(Anadromous Fish  
Habitat Assessment)  
Recommendations

# Appendix E

## Comparison of King George FEIS with AFHA (Anadromous Fish Habitat Assessment) Recommendations

The January 1995 Forest Service Report to Congress, Anadromous Fish Habitat Assessment (AFHA) contained 14 recommended improvements to be considered for fish habitat protection. The Alaska Regional Forester directed us to implement these improvements in a memo dated August 25, 1995. Specifically, he stated that “these items...will only be accomplished to the extent they can be as part of other on-going work, without substantially disrupting or delaying project planning or implementation.”

Because King George planning was well underway and most of the field inventory was completed by this date, we decided it would be useful to compare the King George FEIS with the recommendations. Some improvements are beyond the scope of individual projects such as King George. Specifically, the first four were assigned to the TLMP Revision Team for consideration during the forest plan revision. We have indicated the areas below where we have made progress on implementing the AFHA recommendations.

### **Increase protection of headwater areas, including steep slopes, high hazard soils, and Class III and smaller streams.**

Although we have not been required to proceed on increased protection, the King George FEIS does include increased protection of headwater areas through the use of partial retention harvest prescriptions, the use of helicopter yarding, and an emphasis on field verification of fish habitat and tributaries.

## **E - Comparison of FEIS with AFHA**

### **Modification of streamside buffers on floodplains and confined alluvial channels.**

We have not been required to increase buffer width beyond that required by the Tongass Timber Reform Act. Nevertheless, many floodplain and alluvial streams adjacent to harvest units have greater than 100-foot no harvest buffers.

### **Clarification of the TLMP goal to “preserve biological productivity of [every] fish stream on the Tongass.”**

This item is beyond the scope of project level planning.

### **Establish quantitative objectives for fish habitat capability.**

This item is beyond the scope of project level planning.

### **Increase monitoring on implementation and effectiveness of procedures for anadromous fish habitat protection.**

This item is also beyond the scope of an individual project, but refer to Chapter 3 and the FEIS monitoring plan (Appendix C) for information about project monitoring.

### **Examine and improve Best Management Practices.**

We have used the results of past BMP implementation monitoring to refine our application of BMPs in the King George study area. Specific actions include: increased protection of unstable slopes, increased protection of floodplains, increased emphasis on field verification of all streams in the project area, removal of windthrow-prone trees from unmanaged areas within units (particularly adjacent to v-notches), improved wetland identification and analysis, modification of sort yard and LTF location and design, thorough consideration of road management options (including road closures), and stream crossing locations and structure design to maintain channel stability and minimize failures.

### **Begin implementing watershed analysis.**

This FEIS does not contain a Watershed Analysis at the scale of the pilot analyses conducted for the AFHA. However, the assessment of the freshwater system in Chapter 3 provides a thorough, watershed-based, holistic approach to timber sale planning that emphasizes the protection of aquatic habitat.

### **Ensure that management direction for habitat protection is consistently applied.**

The Alaska Regional Forester issued a memo on November 21, 1995, which clarifies stream classification and application of statutory (TTRA) buffers. The buffer policy is consistent with policy previously implemented at the Wrangell Ranger District and does not affect King George buffers. The letter sets direction for a new stream classification as follows:

Class I and II streams: No change from existing policy.

Class III streams: Defined as “perennial and intermittent streams with no fish populations, but which have sufficient flow or transport sufficient sediment and debris to have an immediate influence on downstream water quality or fish habitat capability. These streams generally have bankfull widths greater than 5 feet and are highly incised into the surrounding hillslope.”

Class IV streams: Defined as “other intermittent, ephemeral, and small perennial channels with insufficient flow or sediment transport

## E - Comparison of FEIS with AFHA

capabilities to have an immediate influence on downstream water quality or fish habitat capability. These streams are shallowly incised into the surrounding hillslope.”

Non-streams: Defined as “rills and other watercourses, generally intermittent and less than 1 foot in bankfull width, little or no incisement into the surrounding hillslope, and with little or no evidence of scour.”

The memo states that this classification “should be phased in...to the extent practicable and consistent with avoiding significant disruption or delay of the NEPA and project implementation processes.” The memo also states that the addition of the Class IV streams and non-streams “should not change existing stream protection requirements contained in existing timber sale contract provisions and the BMP handbook.”

Since King George planning was well underway at the time of this letter, and most of the stream verification was complete, it was not practical to re-classify the study area streams. Most headwater and tributary streams were classified according to current mapping protocols: all streams greater than 3 feet bankfull width which appeared to influence downstream water quality were classified as Class III streams. For this reason, it can be assumed that the FEIS includes most Class IV streams within units. The smaller, shallowly incised streams generally receive protection according to timber sale contract provision “c” (Appendix B).

### **Accelerate acquisition of research information.**

This item is beyond the scope of project level planning.

### **Develop a Forest-wide restoration strategy for degraded watersheds.**

This item is beyond the scope of project level planning.

### **Inventory anadromous fish habitats and communities.**

Chapter 3 describes the King George Creek fish habitat inventory results.

### **Develop Forest-wide definitions, inventory standards, and interpretations of mass-movement-hazard areas and conduct full inventory and analysis of high-hazard and very high-hazard soils.**

This item is beyond the scope of project level planning.

### **Classify streams draining intermittent and ephemeral channels.**

Many of the mapped Class III streams in the King George study area are intermittent or ephemeral. Refer to the discussion of the Regional Forester’s November 21, 1995, memo, above.

### **Further develop the process for setting quantitative objectives for fish habitat.**

This item is beyond the scope of project level planning. However, our experience inventorying habitat in the King George drainage has contributed to the regional effort in setting quantitative objectives.

In summary, the planning effort on King George has made significant progress toward accomplishing the direction established as a result of the Anadromous Fish Habitat Assessment.



# Appendix F

## Road Management Strategy

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## Road Management Strategy

The road management strategy designed for Alternative 5 addresses issues of cost efficient road construction and maintenance, wildlife habitat security in the King George drainage, and the long term effects of roads on water quality and fisheries. The strategy strikes a balance between economics and environmental impacts and demonstrates adaptive management (or monitoring feedback loop) based on what we know about the existing condition of some isolated or inactive road systems that may be compared to the King George road system. Changes in the road management strategy were implemented between the Draft and Final EIS in response to public, state, and federal agency comments on the DEIS.

Roads in southeast Alaska are expensive to build and maintain. Monitoring results indicate that roads which provide continual or frequent access for timber harvest are generally in good condition with few drainage structure failures. Road maintenance on these roads is often performed by timber purchasers commensurate with their use of the roads to haul timber. The main road on Wrangell Island is a good example of this type of road.

In contrast, monitoring results from more isolated road systems which provide short-term or infrequent access for timber harvest indicate that drainage systems begin to deteriorate and fail without regular maintenance. Maintenance of these roads is generally limited to hand tools and when drainage system failures are discovered, a maintenance project must be specifically planned and funded to correct the problem and any resulting resource impacts. The road system recently constructed at Frosty Bay and some older low standard roads on Zarembo Island are good examples of this type of road.

### Road Management During Initial Timber Sale

We assumed that the entire road system would provide access for timber hauling and associated administrative use throughout the initial timber sale. General public use will be prohibited or restricted for safety purposes during this time. When timber hauling and cleanup is complete we will assess the condition of the drainage system, address maintenance and modifications as necessary, and initiate restricted access measures as follows.

## **F - Road Management Strategy**

### **Road Management After Initial Timber Sale**

#### **Road 6549 through Milepost 3.7:**

This road includes all of Road Segments 1 and 2, and Road Segment 4 up to the first hydrological site.

Allow general public use (high clearance vehicles) up to gate installed at the first hydrologic site in Segment 4. Provide signing at the pass to inform of road closure ahead, with a safe turnaround area near the gate. Perform road maintenance in accordance with Level 2 (BMP 14.20).

#### **Road 6549 from Milepost 3.7 to 5.65:**

This road includes Road Segment 4 beyond its first hydrological site and Road Segment 8 up to its first hydrological site.

Prohibit general public motorized use. Welcome foot and bicycle travel. Allow periodic use for administrative purposes such as small sales, silvicultural activities, road maintenance, fish habitat enhancement, etc. Install drivable cross-ditches to safeguard minor drainage structures. This measure will minimize erosion in the event of structure failure. Perform road maintenance in accordance with Level 1 (BMP 14.20).

#### **Road 6549 from Milepost 5.65 to 6.3:**

This road includes Road Segment 8 from its first hydrological site to the beginning of temporary road in Unit 26.

Close road by removing all drainage structures including and beyond the first hydrological site in Road Segment 8. Restore natural drainage patterns according to BMP 14.24. Seed and fertilize disturbed areas adjacent to streams.

#### **Road 51491:**

This road includes Road Segment 3.

Install rock or other removable barrier at junction with Road 6549. Prohibit general public motorized use. Welcome foot and bicycle travel. Allow periodic use for administrative purposes such as small sales, silvicultural activities, road maintenance, etc. Install drivable cross-ditches to safeguard minor drainage structures. This measure will minimize erosion in the event of structure failure. Perform road maintenance in accordance with Level 1 (BMP 14.20).

#### **Road 51493 through Milepost 0.7:**

This road includes Road Segment 6.

Prohibit general public motorized use. Welcome foot and bicycle travel. Allow periodic use for administrative purposes such as small sales, silvicultural activities, road maintenance, etc. Install drivable cross-ditches to safeguard minor drainage structures. This measure will minimize erosion in the event of structure failure. Perform road maintenance in accordance with Level 1 (BMP 14.20).

## F - Road Management Strategy

### Road 51493 from Milepost 0.7 to end:

This road includes Road Segment 7.

Close road by removing all drainage structures including and beyond the first hydrological site. Restore natural drainage patterns according to BMP 14.24. Seed and fertilize disturbed areas adjacent to streams.

Road Management Objectives for the three system roads in the King George Timber Sale area follow.

Figure F-1: Road Numbers



## ROAD MANAGEMENT OBJECTIVES

**ROAD NUMBER:** 6549

**ROAD NAME:** NEWLYWED

**NEPA:** FEIS JULY, 1996

**TERMINI:** T64S, R83E Sec. 13, 14, 15, 16, 21, 28, 20, 19 - dead end

**LENGTH (MILES):** 6.3

**VCU:** 462

**FUNCTIONAL CLASS/TRAVEL CLASS:** Collector

**DESIGN SPEED (MPH):** 20

**WIDTH(ft):** 14

**SERVICE LIFE:** Long Term

**DESIGN VEHICLE:** Log Truck

**CRITICAL VEHICLE:** Mobile Yarder

**TRAFFIC SERVICE LEVEL:** C

**HIGHWAY SAFETY ACT:** No

### MAINTENANCE LEVELS:

#### ACTIVE SALE:

(Operational) 2

#### POST SALE:

(Objective) 2 MP 0.0-3.7

(Objective) 1 MP 3.7-6.3

**INTENDED PURPOSE:** ROS class in the Honeymoon drainage is Scenic Viewshed and in the King George drainage is Modified Landscape. Part of the initial entry for timber harvest of 26.8 MMBF with future small sales over a five year period. The management objective is to provide roaded access for timber harvest, balance amenity and commodity interests while maintaining important ecological functions such as wildlife habitat, water quality, and fisheries.

### Travelway Management Prescription ( D )

Operational Maintenance Level 2: MP 0.0 - 6.3

General public use is prohibited during periods of commercial use. The prohibition may be a total restriction or limited to hours and days of actual timber haul. The surface of this road can be rough and irregular. Travel with low clearance vehicles will be difficult.

Objective Maintenance Level 2: MP 0.0 - 3.7

After timber haul general public use is unrestricted for high clearance vehicles. The surface of this road can be rough and irregular and may have driveable cross ditches at some locations

Objective Maintenance Level 1: MP 3.7 - 5.65

After timber haul this road will be closed by means of a gate at MP 3.7. The surface of this road can be rough and irregular and may have driveable cross ditches at some locations to facilitate maintenance traffic, if necessary.

Objective Maintenance Level 1: MP 5.65 - 6.3

After timber haul this road will be closed by removing drainage structures and reestablishing natural drainage patterns.

### Travel Management Strategy (Class 5 Road)

Encourage	N/A
Accept	High Clearance Vehicles, MP 0.0 to MP 3.7 after timber haul.
Discourage	N/A
Prohibit	All motorized vehicles MP 0.0 to MP 6.3, except for logging traffic, administrative use, and permitted traffic during periods of commercial use. All motorized vehicles MP 3.7 to MP 6.3 post timber haul.
Eliminate	N/A

## ROAD MANAGEMENT OBJECTIVES

**ROAD NUMBER:** 51491

**ROAD NAME:** PRINCE

**NEPA:** FEIS JULY, 1996

**TERMINI:** T64S, R83E Sec. 14, 11 - dead end

**LENGTH (MILES):** 0.8

**VCU:** 462

**FUNCTIONAL CLASS/TRAVEL CLASS:** Local

**DESIGN SPEED (MPH):** 10

**WIDTH(ft):** 14

**SERVICE LIFE:** Long Term

**DESIGN VEHICLE:** Log Truck

**CRITICAL VEHICLE:** Mobile Yarder

**TRAFFIC SERVICE LEVEL:** D

**HIGHWAY SAFETY ACT:** No

### MAINTENANCE LEVELS:

**ACTIVE SALE:**

(Operational) 2

**POST SALE:**

(Objective) 1

**INTENDED PURPOSE:** ROS class is Scenic Viewshed. Part of the initial entry for timber harvest of 26.8 MMBF with future small sales over a five year period. The management objective is to provide roaded access for timber harvest, balance amenity and commodity interests while maintaining important ecological functions such as wildlife habitat, water quality, and fisheries.

### Travelway Management Prescription ( D )

Operational Maintenance Level 2: MP 0.0 - 0.8

General public use is prohibited during periods of commercial use. The prohibition may be a total restriction or limited to hours and days of actual timber haul. The surface of this road can be rough and irregular. Travel with low clearance vehicles will be difficult.

Objective Maintenance Level 1: MP 0.0 - 0.8

After timber haul this road will be closed by means of a rock or other removable barrier. The surface of this road can be rough and irregular and may have driveable cross ditches at some locations to facilitate maintenance traffic, if necessary.

### Travel Management Strategy (Class 5 Road)

Encourage	N/A
Accept	N/A
Discourage	N/A
Prohibit	All motorized vehicles MP 0.0 to MP 0.8, except for logging traffic, administrative use, and permitted traffic during periods of commercial use.
Eliminate	N/A

## ROAD MANAGEMENT OBJECTIVES

**ROAD NUMBER:** 51493

**ROAD NAME:** QUEEN

**NEPA:** FEIS JULY, 1996

**TERMINI:** T64S, R83E Sec. 28,29,32 - dead end

**LENGTH (MILES):** 1.6

**VCU:** 462

**FUNCTIONAL CLASS/TRAVEL CLASS:** Local

**DESIGN SPEED (MPH):** 10

**WIDTH(ft):** 14

**SERVICE LIFE:** Long Term

**DESIGN VEHICLE:** Log Truck

**CRITICAL VEHICLE:** Mobile Yarder

**TRAFFIC SERVICE LEVEL:** D

**HIGHWAY SAFETY ACT:** No

### MAINTENANCE LEVELS:

**ACTIVE SALE:**

(Operational) 2

**POST SALE:**

(Objective) 1

**INTENDED PURPOSE:** ROS class is Modified Landscape. Part of the initial entry for timber harvest of 26.8 MMBF with future small sales over a five year period. The management objective is to provide roaded access for timber harvest, balance amenity and commodity interests while maintaining important ecological functions such as wildlife habitat, water quality, and fisheries.

### Travelway Management Prescription ( D )

Operational Maintenance Level 2: MP 0.0 - 1.6

General public use is prohibited during periods of commercial use. The surface of this road can be rough and irregular. Travel with low clearance vehicles will be difficult.

Objective Maintenance Level 1: MP 0.0 - 0.7

After timber haul this road will be closed by means of a gate at MP 3.7, Rd #6549. The surface of this road can be rough and irregular and may have driveable cross ditches at some locations to facilitate maintenance traffic, if necessary.

Objective Maintenance Level 1: MP 0.7 - 1.6

After timber haul this road will be closed by removing drainage structures and reestablishing natural drainage patterns.

### Travel Management Strategy (Class 5 Road)

Encourage	N/A
Accept	N/A
Discourage	N/A
Prohibit	All motorized vehicles MP 0.0 to MP 1.6, except for logging traffic, administrative use, and permitted traffic during periods of commercial use.
Eliminate	N/A

# **Appendix G**

## **Public Comments and Responses to the DEIS**

# Appendix G

## Public Comments and Responses to the DEIS

**United Southeast Alaska Gillnet Association**  
**204 N. Franklin St. Ste. 204**  
**Juneau, AK 99801**

Meg Mitchell, Team Leader  
Wrangell Ranger District  
Tongass National Forest  
Box 51  
Wrangell, AK 99929

Dear Ms. Mitchell:

After review of the Draft EIS for the King George Timber Sale on North Etolin Island we have found that some of the proposed activities will have a very detrimental effect on the fishermen who gillnet for salmon in the waters adjacent to this timber sale. Specifically the dumping of logs and the associated debris into log booms will allow many sticks, branches, small trees and other types of slash which are stuck in the chokers used to remove logs from the woods by helicopter to escape into the surrounding waters. This free floating debris may cause both economic losses and physical injury to commercial fishermen, and will also be a hazard to navigation for all small vessels and skiffs which use this area.

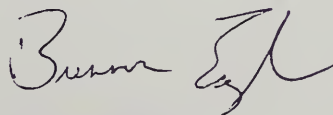
Most of the proposed helicopter dumping will take place in ADF&G district 8 which has a long history of use as a drift gillnet area and in the past few years this use has increased. District 8 is now usually open for fishing three to six days per week from the second week in June until the end of September. At times this area has more than 75 boats actively gillnetting for salmon. Some of these boats will be fishing in Chichagof Pass and west to the area boundary approximately five miles west of King George. When logging slash escapes from the proposed boom area it will very quickly become entangled in their nets, which will lead to damage as the web of these nets is quite fragile, approximately 30 pounds breaking strength. Damaged nets leads to an economic loss as fish are able to swim through the damaged areas and fishermen must spend time repairing the damage which will sometimes result in lost fishing time when this area is open for five and six days per week. These fishermen could also be physically injured when they are retrieving their net at night and a limb that is stuck in the net comes over the back of the boat and strikes them.

Our organization feels strongly that the Forest Service's proposed plan to drop logs into a log boom and require clean up of any escaped debris will not work. This plan will not work because the tidal current in this area can exceed two knots and the logging slash can quickly be a very long distance from the dump site, or stuck in a gillnet. Another problem with this plan is that this debris is usually very hard to see, especially during rainy, windy weather because it does not float very high in the water.

We feel that it is very important that this debris not be present in the water during times that the commercial fleet is using this area. We would propose that logs dropped from helicopters be dropped onto land or a floating barge so that all of the debris can be contained and cleaned up in an orderly manner instead of using a system that by design will fail to contain the logging slash and will have adverse effects on other resource users in this area

Please direct any comments or questions on this matter to Brennon Eagle, Wrangell Chapter President, Box 576, Wrangell, AK, 99929, phone 874-2162.

Sincerely,



Brennon Eagle



United States  
Department of  
Agriculture

Forest  
Service

Alaska Region Tongass National Forest  
Stikine Area  
P.O. Box 309  
Petersburg, AK 99833

File Code: 1950

Date: August 1, 1996

Brennon Eagle  
Wrangell Chapter President  
United Southeast Alaska Gillnet Association  
P.O. Box 576  
Wrangell, AK 99929

Dear Mr. Eagle:

Thank you for your comments on the King George DEIS. I would like to take this opportunity to respond to your concerns regarding helicopter logging and the practice of dropping logs directly into saltwater.

We are very concerned about the impacts that timber harvest may have on other resources, including commercial and sport fisheries. The use of direct helicopter logging to boom bags is a safe and economical way of harvesting timber from available forest land that is close to saltwater. However, boom bags are not 100% effective in containing loose limbs and dense "sinker" logs. In response to the concern that you and several others have raised, we will require the successful bidder of the King George sale to yard all helicopter units to the nearest road system, or to a processing barge anchored near the unit. In addition, we will require immediate retrieval of limbs or logs accidentally dropped into the water.

We feel the practice of landing logs on a processing barge or directly to the road system will greatly reduce the chance of limbs and tops falling into the water and becoming hazards to sport and commercial fishing, as well as navigation.

Thank you again for your comments.

Sincerely,

  
ABIGAIL R. KIMBELL  
Forest Supervisor

G - 2



Caring for the Land and Serving People

Printed on Recycled Paper  
FS-6200-28b (12/93)

Dear Abigail Kimball,  
I'm concerned about the limbs  
in the water from the helicopter  
logging at King George.

I had problems charter sport  
fishing at Blake Island from  
the limbs & tops that floated  
down from the helicopter logging  
in Bradfield cang.

King George and Big bend is  
a gillnet Area and limbs  
aren't any fun in a salmon  
Gill net. It is also a major  
sport fish Area for Wrangell.

Sincerely  
Harold Bailey

Wrangell Ranger District	
JUN -6 '96	
	Act.
<input checked="" type="checkbox"/> Dist. Ranger	
<input type="checkbox"/> B.M.A.	
<input type="checkbox"/> T.M. Oper.	
<input type="checkbox"/> O.R.A.	
<input type="checkbox"/> F&W	
<input type="checkbox"/> Planning	
<input type="checkbox"/> Engineering	
<input type="checkbox"/> Log Acct.	
<input type="checkbox"/> Resource Clerk	
<input type="checkbox"/> G - 3	



United States  
Department of  
Agriculture

Forest  
Service

Alaska Region Tongass National Forest  
Stikine Area  
P.O. Box 309  
Petersburg, AK 99833

---

File Code: 1950

Date: August 1, 1996

Harold Bailey  
P.O. Box 887  
Wrangell, AK 99929

Dear Mr. Bailey:

Thank you for your comments on the King George DEIS. I would like to take this opportunity to respond to your concerns regarding helicopter logging and the practice of dropping logs directly into saltwater.

We are very concerned about the impacts that timber harvest may have on other resources, including commercial and sport fisheries. The use of direct helicopter logging to boom bags is a safe and economical way of harvesting timber from available forest land that is close to saltwater. However, boom bags are not 100% effective in containing loose limbs and dense "sinker" logs. In response to the concern that you and several others have raised, we will require the successful bidder of the King George sale to yard all helicopter units to the nearest road system, or to a processing barge anchored near the unit. In addition, we will require immediate retrieval of limbs or logs accidentally dropped into the water.

We feel the practice of landing logs on a processing barge or directly to the road system will greatly reduce the chance of limbs and tops falling into the water and becoming hazards to sport and commercial fishing, as well as navigation.

Thank you again for your comments.

Sincerely,

  
ABIGAIL R. KIMBELL  
Forest Supervisor



6-2-96

TO MEG MITCHELL

THIS LETTER IS WRITTEN IN  
CONCERN WITH THE PROPOSED  
KING GEORGE TIMBER SALE.

AS YOU KNOW, I AM A COMMERCIAL  
FISHERMAN, AND ONE OF MY  
FISHERIES, IS BEAM TRAWLING SHRIMP.

OTHER FISHERIES I AM INVOLVED WITH  
ARE, CRABBING, POT SHRIMP, AND OTTER  
TRAWL FINFISH.

MY CONCERN IS WITH THE PLANNED  
HELICOPTER LOGGING. THE DRAFT ENVIRONMENTAL  
ANALYSIS OVERLOOKS THE PROBLEM OF SINKING  
LOGS, BROKEN LIMBS AND OTHER LOGGING  
GARBAGE GOING IN THE WATER.

IN APRIL OF 1996, I WAS BEAM  
TRAWLING IN THE BRADFIELD CANAL AREA  
FOR SHRIMP. THERE WAS SO MUCH  
DISCARDED WOODWASTE ON THE BOTTOM  
AT (50 TO 60 FATHOMS) THAT IT WAS VIRTUALLY  
IMPOSSIBLE TO FISH THERE. BOTH BROKEN OFF  
LIMBS, AND SAWED OFF BRANCHES WERE  
CAUGHT IN THE TRAWL. THERE IS NO QUESTION  
IN MY MIND THAT THE WOODWASTE CAME  
FROM THE HELICOPTER LOGGING PROJECT THAT  
TOOK PLACE IN THE SUMMER OF 1995.

I ALSO CAUGHT ONE LOG THAT ENDED UP  
BREAKING MY BEAM TRAWL. THREE OTHER  
BOATS ATTEMPTED TO FISH THERE AT THE SAME  
TIME BUT QUIT BECAUSE OF THE WOODWASTE.

IN PAST YEARS THIS WAS A NICE CLEAN  
AREA TO FISH SHRIMP

THE BRADFIELD CANAL HAS always had some of the nicest shrimp, and it is a regularly area with its own registry, with a 100,000 pound quota. Most of the fishing is done right where the logs were dumped in the water.

After the Area 7 and 8 closed I returned to the Bradfield Canal to fish. I have caught at least three saw logs and a deck load of limbs. One of the logs still had a choker around it. Some of the limbs look like they were broken. Probably when they dropped into the water. Others have sawed off ends. One of the logs looked like it was a tree top and it still had all the limbs on it. The limbs still have needles on them, and are turning black.

None of this problem is currently recognized or acknowledged by the Forest Service, or KAC who got the timber.

I am opposed to helicopter logging where logs are dropped directly into the water, as was done in the Bradfield Canal. Numerous fisheries could be affected by the woodwaste if this type of logging is done. At the King George Timber sale, it could harm the bottom and sea life with unknown damages.

Sign Bob Johnson



United States  
Department of  
Agriculture

Forest  
Service

Alaska Region Tongass National Forest  
Stikine Area  
P.O. Box 309  
Petersburg, AK 99833

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File Code: 1950

Date: August 1, 1996

Bob Johnson  
P.O. Box 2184  
Wrangell, AK 99929

Dear Mr. Johnson:

Thank you for your comments on the King George DEIS. I would like to take this opportunity to respond to your concerns regarding helicopter logging and the practice of dropping logs directly into saltwater.

We are very concerned about the impacts that timber harvest may have on other resources, including commercial and sport fisheries. The use of direct helicopter logging to boom bags is a safe and economical way of harvesting timber from available forest land that is close to saltwater. However, boom bags are not 100% effective in containing loose limbs and dense "sinker" logs. In response to the concern that you and several others have raised, we will require the successful bidder of the King George sale to yard all helicopter units to the nearest road system, or to a processing barge anchored near the unit. In addition, we will require immediate retrieval of limbs or logs accidentally dropped into the water.

We feel the practice of landing logs on a processing barge or directly to the road system will greatly reduce the chance of limbs and tops falling into the water and becoming hazards to sport and commercial fishing, as well as navigation.

Thank you again for your comments.

Sincerely,

  
ABIGAIL R. KIMBELL  
Forest Supervisor



To: King George IDT .  
From: Bruce Eagle  
Wrangell Ak

I have two concerns and one general observation on the King George sale.

Observation: The view from my house is of the "view shed" that is proposed for a heavy hit. The harvest strategy that you are proposing to use is still really an experiment that means in all probability I will be looking at a brown clearcut again. There is enough volume in the unit pool to still get your cut and leave the Zimovia face uncut until next entry. This will give you enough time to see if the partial cuts in Campbell are working. The idea that you have that only Tourists deserve a view is really wrong headed. I have no desire to prevent the harvest of timber on North Etolin, but I want the same consideration for me and my Neighbors that you give the passengers on the Executive Explorer.

#### Problem 1

The Marbled Murrelet (mm) analysis is very flawed. The initial attempt to locate the areas of nesting activity was a good start, but the failure to follow up is inexcusable. I feel the mm use of the area is very high. This comes from observation of the birds in the area for the last 25 years on a 24 hour basis during the summer. The need for more study in the area to locate mm activity needs to be done this summer. The ability of a trained observer to locate the stands of heavy use is hard work but is doable. Determining the location of nests is impossible or damn near so. You guys know the literature on these birds better than I do, but to expect any one to see a nest that is only a depression in the moss from the ground is a bit much. To base your protection of the nest area on this observation is totally nuts. We both know that it is possible to locate nest stands and the entire stand should be protected when found. The protection of mm's is vital to the continued viability of the gillnet fishery in SE. The impact of the gear on the birds is very slight, but if the bird were to become listed it would have a severe impact on the income of the 40 fishermen in Wrangell who strangle fish for a living.

#### Problem 2

The yarding of logs to saltwater with a helicopter has the potential to introduce a lot of limbs into the water. The amount of limbs in the water in the Bradfield during the logging of the Campbell sale was totally in excess to reasonable expectations. In fact was in violation of both State and Federal regulation. If this amount of limbs shows up in the area during your sale I will personally sue both the operator of the sale and the Forest

Service. While this may sound threaten the introduction of this type of pollution to this area that has a high historic use by sport and commercial fishermen is both an economic threat and a life and property threat to me personally and to many other fishermen who use this area.

If the sale is allowed with specific performance guarantees and specific alternatives to water dropped yarding., I will not appeal. If a solution is not found to guarantee a minimum of slash introduction I will have no other option than the purchase of a 32 cent stamp and retention of council.

I have enclosed a copy of the State of Alaska regulations that prohibits the placement of materials in the water where boating takes place.

SENT BY: Xerox Telecopier 7020 : 5-4-96 : 4:54PM :  
 Register 137, April 1996

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915078742487:W 2

ENVIRONMENTAL CONSERVATION

STATE WATER QUALITY STANDARDS FOR RESIDUES IN WATERS WITHIN

(18 AAC TO. 020(b)(2)(B)(i))

(2) MARINE WATER USES	RESIDUES Floating Solids, Debris, Sludge, Deposits, Foam, Scum, or Other Residues
(A) Water Supply (i) aquaculture	May not, alone or in combination with other substances or wastes, make the water unfit or unsafe for the use. May not cause detrimental effects on established water supply treatment levels.
(A) Water Supply (i) seafood processing	May not, alone or in combination with other substances or wastes, make the water unfit or unsafe for the use; cause a film, sheen, or discoloration on the surface of the water or adjoining shorelines; cause leaching of toxic or deleterious substances; or cause a sludge, solid, or emulsion to be deposited beneath or upon the surface of the water, within the water column, on the bottom, or upon adjoining shorelines.
(A) Water Supply (ii) Industrial	May not, alone or in combination with other substances or wastes, make the water unfit or unsafe for the use.
(B) Water Recreation (i) contact recreation	Same as (2)(A)(ii).
* (B) Water Recreation (i) secondary recreation	Same as (2)(A)(i).
(C) Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife	May not, alone or in combination with other substances or wastes, make the water unfit or unsafe for the use, or cause acute or chronic problem levels as determined by bioassay or other appropriate methods. May not, alone or in combination with other substances, cause a film, sheen, or discoloration on the surface of the water or adjoining shorelines; cause leaching of toxic or deleterious substances; or cause a sludge, solid, or emulsion to be deposited beneath or upon the surface of the water, within the water column, on the bottom, or upon adjoining shorelines.
(D) Harvesting for Consumption of Raw Mollusks or Other Raw Aquatic Life	May not make the water unfit or unsafe for the use; cause a film, sheen, or discoloration on the surface of the water or adjoining shorelines; cause leaching of toxic or deleterious substances; or cause a sludge, solid, or emulsion to be deposited beneath or upon the surface of the water, within the water column, on the bottom, or upon adjoining shorelines.



United States  
Department of  
Agriculture

Forest  
Service

Alaska Region    Tongass National Forest  
Stikine Area  
P.O. Box 309  
Petersburg, AK 99833

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File Code: 1950

Date: August 1, 1996

Bruce Eagle  
P.O. Box 303  
Wrangell, AK 99929

Dear Mr. Eagle:

Thank you for your comments on the King George DEIS. I understand and am responding to your concerns regarding the Zimovia viewshed, marbled murrelets, and helicopter logging directly to saltwater.

The King George IDT recommended modifying the design of units 3, 4 and 30 in Alternative 5, changing these units from cable harvest to helicopter harvest, and dropping the road across Zimovia face. While this will result in more total acres of harvest within the view from your home, I feel the harvest prescriptions and unit designs will keep the visual impact to a minimum. These alternatives to clearcutting are indeed experimental, but they are also more conservative with smaller harvest units and more green tree retention than the treatments used on the Campbell Timber Sale. We have responded to the EPA suggestion to include more sketches of the views, which we hope will help you better "see" the effects we anticipate.

As you pointed out, our surveys for marbled murrelets were very limited and the fact that we did not find any nests does not mean that there are none in the area. In fact, we expect that marbled murrelets nest in the area based on observations of murrelets circling over some stands. Since locating individual nest trees is so difficult, we are not relying solely on the nest buffer restrictions. The old growth reserve strategy that we outlined in Appendix A of the draft EIS is designed to provide habitat throughout the Tongass to maintain minimum viable populations for a variety of species, which we expect will include marbled murrelets.

At this time, we are hoping that our reserve strategy and old growth in areas that are not feasible to harvest will provide adequate nesting habitat to keep the marbled murrelet from being listed as threatened or endangered. If the species is listed, you are correct that future restrictions may affect both timber harvesting and gillnetting operations.

We are very concerned about the impacts that timber harvest may have on other resources, including commercial and sport fisheries. The use of direct helicopter logging to boom bags is a safe and economical way of harvesting timber from available forest land that is close to saltwater. However, boom





Mr. Bruce Eagle

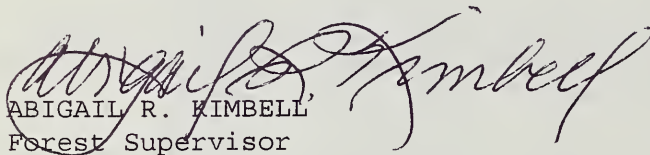
2

bags are not 100% effective in containing loose limbs and dense "sinker" logs. In response to the concern that you and several others have raised, we will require the successful bidder of the King George sale to yard all helicopter units to the nearest road system, or to a processing barge anchored near the unit. In addition, we will require immediate retrieval of limbs or logs accidentally dropped into the water.

I feel the practice of landing logs on a processing barge or directly to the road system will greatly reduce the chance of limbs and tops falling into the water and becoming hazards to sport and commercial fishing, as well as navigation.

Thank you again for your comments.

Sincerely,

  
ABIGAIL R. KIMBELL  
Forest Supervisor



June 10, 1996

Dear Meg:

Thanks for the opportunity to comment on the Draft Environmental Impact Statement (EIS) for the King George Timber Sale. I am a life long Native Alaskan and I believe strongly in the importance of contributing my viewpoint to this process. Also, because I live directly across from Honeymoon, I am concerned and alarmed by the impact this Timber Sale will have on my view.

I am not opposed to logging and the timber industry and in fact I have believed for many years that a responsible, sustainable timber industry is possible with value-added manufacturing to keep jobs and profits in the local area. If we increased the value of the raw log before shipping it to market we could decrease harvest levels and still provide timber jobs. It's crucial that we consider the rest of the economy; the fishing industry, the tourism industry, subsistence, biodiversity, and the wilderness values which make the Tongass such a wonderful place to live. My hope is that we will do it right here in the Tongass, rather than making the same mistakes that were made in Washington and Oregon, so that all this will be here for future generations. Unfortunately, it is very difficult for people to let go of what they have relied on for their livelihood to try something different.

I would prefer Alternative 6, No Action. Although the Draft EIS says Alternative 6 "would not contribute to local employment or income", what about fishing, trapping, guided hunting, tourism? Forests are not only a timber resource to be cut. According to Bill McKibben in Audubon (May/June 1996), standing forests have an economic benefit just by themselves. This is new way of thinking is important because old growth forests cannot be replaced. We need to look many generations into the future and think about the trees' value as assets then. I imagine standing trees will be viewed much differently than they are today.

Alternative 1 would be my second choice because no roads would be constructed. I do **NOT** want to see a Log Transfer Facility and roads constructed right across the bay, especially since Pat's Creek LTF is close enough to use and since harvesting would be done by helicopter, it would make sense to use it instead of constructing a new one. We all know that clear cutting and road building have been, and continue to be, detrimental to fisheries and water quality on the Tongass. The fishing industry in Wrangell is vital to our economy so freshwater systems that support anadromous fish **MUST** be protected. Hopefully helicopter logging would minimize these hazards.

I must say, however, that I sincerely hope that you won't log the part of Etolin that I see every day. The richness and diversity of wildlife that I enjoy on a daily basis cannot be sustained with the kind of logging activity planned for Honey moon. Please leave our last remaining old growth forests alone. Of course there is a need for timber, but not in our own front yard.

Sincerely,

Mary Barkeland  
Box 1728  
Wrangell



United States  
Department of  
Agriculture

Forest  
Service

Alaska Region

Tongass National Forest  
Stikine Area  
P.O. Box 309  
Petersburg, AK 99833

File Code: 1950

Date: August 1, 1996

Mary Berkeland  
P.O. Box 1728  
Wrangell, AK 99929

Dear Ms. Berkeland:

Thank you for your comments on the King George DEIS. I would like to take this opportunity to respond to the concerns you raised.

We received several comments, both in the scoping phase and the comment period, from people concerned about the effects of timber harvest on scenery. Our analysis took the views of Zimovia residents into account. As you point out, the range of alternatives is responsive to scenery concerns by proposing various strategies (avoidance, small harvest units with cable logging, and larger units with partial cutting).


You stated that you favored Alternative 6 (the "no action" alternative). This alternative was included in the analysis because it is a viable alternative which I considered along with the rest of the alternatives.

Your second alternative choice was Alternative 1 because helicopter logging would not require clearcutting or road building, both of which you feel would be detrimental to fisheries and water quality. Although harvest and road building has a higher risk than doing nothing, I feel we have addressed fishery and water quality concerns through unit and road design and mitigation. Please see the discussion on the freshwater system in Chapter 3 and my response to the Environmental Protection Agency.

I have selected Alternative 5, but have modified the harvest units in the Zimovia Face Land Unit in response to concerns about long-term views of the Zimovia face from Wrangell Island. The most visible units (Units 3, 4, and 30) will be logged by helicopter, and the road past Unit 5 has been eliminated. The scenery effects to the Zimovia Viewshed under Alternative 5 have been adjusted to show this change between Draft and Final EIS.

A second reason you favored Alternative 1 was because it would not require the construction of a Log Transfer Facility (LTF) near the mouth of Honeymoon Creek. Many residents were concerned with the visual effects of this LTF. Using mitigation techniques such as vegetative screening and altering the viewed angle, the IDT has determined that the overall effects of this LTF will be roughly one-quarter that of the Pat's Creek LTF. We have included sketches to help illustrate what we believe the LTF will look like in comparison to the Earl West LTF (see Appendix D).

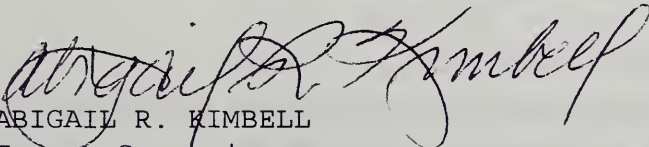




Many people echoed your sentiments that we need to harvest timber, but not where we have to look at the results of timber harvest. A large percentage of harvesting in the past has occurred away from the views of Southeast communities. It wouldn't be possible to provide a sustainable harvest level for existing Southeast communities if we concentrate only in areas that cannot be seen. Sustainable logging needs to be well distributed to avoid over-harvesting some areas. Well distributed populations of fish and wildlife ultimately means that we can not 'sacrifice' areas away from views and ultimately leads to well distributed logging. In the King George Timber Sale, I am trying to meet the need for timber while addressing scenic quality by designing units which are largely unnoticeable or appear like natural disturbances (such as landslides and windthrow). Even though I realize it is not your preferred alternative, I feel that Alternative 5 (as modified in response to the issues you raise), will strike a good balance between the need for timber, and the need to protect scenic quality and other resources. I direct your attention to the Record of Decision that is published with the Final EIS for a more in-depth explanation of the decision and my conclusions.

Thank you again for your comments.

Sincerely,



ABIGAIL R. KIMBELL  
Forest Supervisor





Post Office Box 6600  
Ketchikan, Alaska 99901  
U.S.A.

TEL 907/225-2151  
FAX 907/225-8260

June 7, 1996

RECEIVED  
JUN 12 1996  
FOREST SERVICE

Ms. Meg Mitchell  
P. O. Box 51  
Wrangell, AK 99929

Re: King George Timber Sale Draft EIS

Dear Ms. Mitchell:

Ketchikan Pulp Company (KPC) has reviewed the above-referenced Draft EIS and our specific comments follow. In general, we concur with the USFS Preferred Alternative with a number of modifications to keep some additional roads open and make the sale more economic and "saleable".

#### Specific Comments

Table S-1 is incomplete in that the habitat capability percentages for Alternatives 4, 5 and 6 are missing. There appears to be an error in the mid-market net stumpage displayed in the table, i.e. Alternative 5 with 13 miles of road, 26 mmbf and 52% helicopter logging does not seem like it would appraise out at \$16/mbf, even with only 60% of normal profit and risk. We would appreciate receiving a copy of your mid-market analysis to review.

Table 2-6 shows 12.4 miles of spec. road and 1.3 miles of temporary road, but only a total of 12.7 miles of road. There is an error in some part of the data or a typographical error in the table.

The USFS should manage the second growth stands along the beach as part of the timber base rather than converting it to old growth.

For stream buffers in excess of the 100' mandated by TTRA, the more valuable timber should be removed down to 50% of the total basal area.

Ms. Meg Mitchell

June 7, 1996

Page 2

The sort yard should be located as close to the LTF as physically possible. The beach fringe should not dictate the location of the sort yard. Also, the access road from the sort yard to the LTF should be a maximum of 8%.

There is no scientific justification for a 645' (30 acre) buffer around a marbled murrelett nest when there are tens of thousands of the birds in southeast Alaska and they are not in danger of being listed as threatened or endangered. Please delete the buffer proposal from the Final EIS.

The main haul roads should be left open into the King George drainage for salvage, small sales, recreational and administrative access. The costs of maintaining the roads are displayed, but the costs of reconstructing the roads for another entry if they are closed are not displayed. The USFS should look at the reconstruction. This review should show that leaving the roads open is much more cost effective than displayed in the Draft EIS.

The log storage and helicopter water drops should be allowed in waters with a minimum depth of 40', not 60' as stated in the Draft EIS. The state and federal guidelines developed in the early 1980s agreed on a 40' depth. Where did the 60' minimum come from?

The USFS should look at using more and larger clearcuts, especially outside and at the edge of the "scenic viewsheds".

The MP 2.5 barrier on King George Creek should be removed once there is road access to the area.

Sincerely,

*Kenneth J. Hammons* for

Kenneth J. Hammons  
Contract Manager

KJH:ak

cc: O. J. Graham  
T. G. Hicks



United States  
Department of  
Agriculture

Forest  
Service

Alaska Region Tongass National Forest  
Stikine Area  
P.O. Box 309  
Petersburg, AK 99833

File Code: 1950

Date: August 1, 1996

Ken Hammons  
Ketchikan Pulp Company  
P.O. Box 6600  
Ketchikan, AK 99901

Dear Mr. Hammons:

Thank you for your comments on the King George DEIS. I would like to take this opportunity to respond to your specific concerns.

Table S-1 has been corrected to reflect the correct habitat capability percentages for all alternatives. Table 3-29 in the DEIS did show the correct percentages for the key wildlife species.


Table 3-7 shows the mid-market comparison of timber values and logging costs for each of the alternatives. The mid-market analysis is a means of comparing alternatives to each other and to historic averages. It is not intended to indicate advertised rates. At your request, we will send you the cover sheets of the mid-market analysis for each alternative and the current economic comparison for each alternative which uses current market values and logging costs, along with estimated road construction and volume outputs.

Table 2-6 and Table 3-8 contained a typographical error. The length of specified road originally planned for alternative 5 should have been 11.4 miles, not 12.4 as the table indicated. Thank you for bringing it to our attention. Changes to the preferred alternative have reduced the specified road miles to 9.6 miles, and the temporary road to 1.2 miles, for a total of 10.8 miles of road.

The second growth stands along the beach near Honeymoon Creek were harvested in 1965. Current forest practices maintain a 500 foot old-growth beach fringe, and a 1000 foot estuary buffer. Approximately 96 acres of the 165 that were previously harvested fall within beach or estuary buffers, or on high hazard soils (see fig 3-21). These 96 acres will be managed to achieve old growth conditions which best serve their intended purpose under current practices. The remaining 69 acres will be managed for timber production as you suggest.

We have located appropriate Class 1 and Class 2 stream buffers as mandated by TTRA. The study area contains a number of small unmapped fish bearing channels that are tributary to the main streams. Some of these channels do not show on the unit cards, but they have been accounted for in the unit design and layout (even though they are located on the ground, mapping them accurately remains a problem). This gives the appearance that units were located well in excess of





the 100' minimum buffer, which is not always the case. For some units, the unit boundary is set at the limit of logging system capability from the best road or landing location. In other cases, the unit boundary reflects the edge of merchantable timber.

There is not enough space for the sort yard to be immediately adjacent to the LTF, and every effort is being made to minimize the size and amount of cut and fill at the LTF to retain scenic values of the area. In addition, water quality standards can best be maintained by separating the sort yard from the beach, thereby minimizing disturbance to saltwater. The road access is designed at a 13.5% grade because it is the minimum grade which is feasible at this site. Other potential log transfer sites had similar problems or greater environmental effects. Although we understand that this is not optimal, the design is safe and functional.

While it is true that the marbled murrelet is not listed as threatened or endangered in Alaska, comments from the U.S. Fish and Wildlife Service and others indicate that murrelet habitat is an issue. It is also a requirement of the National Forest Management Act that we provide habitat to maintain viable populations of wildlife throughout the planning area. If we do not manage for all species now, it will be much more difficult to implement activities that alter habitat after more species become listed.

Your point about the scientific basis for the 30 acre nest buffer is valid; however, most studies indicate that a larger area is needed to protect murrelet habitat. The USFWS provided citations indicating a minimum of 100 acres for nesting habitat is needed, and the Analysis of the Management Situation, TLMP Revision R10-MB-89 suggests that 600 acres is the optimum size for murrelet nesting habitat. Such large blocks could significantly affect a timber sale if a nest is found after the contract is awarded, so we included what is essentially a minimum amount of interior old growth as a mitigation measure for this sale. This buffer is to be implemented in the event we should locate a nest during implementation or logging operations.

We offered several road management options to be considered in the Draft EIS. The proposed action included closing all roads about five years after harvest. The road management for the preferred alternative has been modified to keep the mainline road open from the LTF to the south edge of Unit 17, where motorized access would be blocked by a gate. The mainline roads beyond the gate just beyond Unit 17 would be maintained with drainage structures in place except for Segment 7 and the last 3/4 mile of Segment 8. These portions of road do not lead to future harvest areas and have stream crossings with a higher risk of plugging up with debris. On these road segments we intend to eventually remove drainage structures and restore natural drainage patterns. Most of the mainline road will be driveable to allow access for small sales, salvage, monitoring and road maintenance needs, but the segments beyond the gate will be restricted to motorized public use.

Valid concerns were raised by local sport and commercial fishermen regarding direct water drops and the amount of limbs, slash and logs that may be lost, creating hazards to fishing gear and people in this popular area. To reduce the amount of slash and logs that may be lost, we will require the operator of this





sale to fly logs either to a barge facility anchored near the unit or the nearest road landing. Immediate retrieval of any logs or limbs inadvertently placed in the water will be required. The shallowest depth for storing rafted logs is 40 feet, by State standards; however, 60 feet is recommended by the Timber Task Force Guidelines for helicopter drops directly to saltwater.

In response to public comments regarding the scenic quality of the study area, we did not propose clearcutting as the dominant method of harvest. Units within the interior of the drainages are generally larger, and harvest higher percentages of the available volume within each unit. While some of these harvest prescriptions are experimental, we feel the approach we are taking can provide needed timber volume while maintaining scenic quality and habitat conservation values of the area.

We do have plans to remove the barrier to fish passage between the upper and lower reaches of King George creek, pending funding or a partner, after road access to the area is established.

Thank you again for your comments.

Sincerely,

  
ABIGAIL R. KIMBELL  
Forest Supervisor





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 10  
1200 Sixth Avenue  
Seattle, Washington 98101

JUN 04 1996

Reply To  
Attn Of: ECO-088

Ref:95-057-AS

Meg Mitchell  
Wrangell Ranger District  
Tongass National Forest  
P.O. Box 51  
Wrangell, Alaska 99929

Dear Ms. Mitchell:

In accordance with our responsibilities under the National Environmental Policy Act and §309 of the Clean Air Act, we have reviewed the Draft Environmental Impact Statement (draft EIS) for the proposed **King George Timber Sale**. The draft EIS analyzes five action alternatives to harvest between roughly 14 and 27 million board feet of timber from about 900 to 1,400 acres on the Etolin Island, approximately 10 miles south-southwest of Wrangell, Alaska. The draft EIS identifies Alternative 5 as the preferred action alternative.

Based on our review, we have rated the draft EIS EC-2 (Environmental Concerns - Insufficient Information). This rating and a summary of our comments will be published in the *Federal Register*.

Our primary concerns, which relate to the need for the final EIS to include additional clarifying information, are highlighted below.

- 1) With respect to roads, we feel that there are two additional areas warranting discussion in the final EIS. First, we recommend that the EIS discuss the US Army Corp of Engineer's position related to the exemption from regulation under Section 404 of the Clean Water Act granted forest roads and how it relates to proposed treatment of roads within the proposed project area. Second, we have concerns that the road closure methods proposed in the draft EIS are not consistent with applicable State of Alaska regulations and current Forest Service direction. We recommend that the final EIS (and the ROD associated with the final decision) clearly identify the methods to be used to close roads, and provide a demonstration that they are consistent with current applicable regulations and Forest Service direction.
- 2) We recommend that the final EIS provide a stronger link between the proposed action and other planning activities on Etolin Island, particularly the landscape analysis presented in Appendix A. This would provide the appropriate context for understanding the selection

of the proposed project area and the range of target harvest volumes identified in the purpose and need section of the draft

- 3) We recommend that the final EIS include more information related to the water quality, fish habitat and terrestrial wildlife habitat values of the Honeymoon Creek watershed. Based on the information presented in the draft EIS, we were unable to determine the "value" of this watershed and, consequently, were unable to fully evaluate the consequences associated with road construction and timber harvesting activities in it.

While the concerns outlined above and contained in our enclosed detailed comments are generally critical in nature, we would also like to acknowledge that we found elements of the draft EIS to be particularly useful. From a public involvement perspective, we found the document to be quite effective in conveying the role the public plays in the project development process. The quoting of comments provided during scoping and the highlighting of important elements contained in the text in the margins of the document were particularly useful. We also found that the evaluation of the proposed project relative to the Alaska Timber Task Force guidelines for log transfer facilities (Appendix D) and the recommendations contained in the Anadromous Fish Habitat Assessment report (Appendix E) provide the appropriate context for examining the proposed project in the context of current applicable regulations and Forest Service direction.

Enclosed please find our detailed comments, which elaborate further on the issues identified above, as well as other areas we believe need to be addressed in the final EIS. We are interested in working closely with the Forest Service in the resolution of these issues and I encourage you to contact Bill Ryan at (206) 553-8561 at your earliest convenience to discuss our comments and how they might best be addressed.

Thank you for the opportunity to review this draft EIS.

Sincerely,



Richard B. Parkin, Manager  
Geographic Implementation Unit

Enclosure

cc: Jim Ferguson, ADEC  
NMFS  
ADFG  
COE-Alaska District

## **Detailed Comments on the King George Timber Sale Draft Environmental Impact Statement (draft EIS)**

### **Roads**

The EIS indicates that the Forest Service is presently weighing a range of management options for roads proposed to be constructed with project implementation. From our perspective, there are two areas that require consideration beyond what is presently contained in the draft EIS.

As you are aware, the US Army Corp of Engineers (USACOE) has indicated in their comments on recent Tongass timber sale EISs that the exemption from regulation under Section 404 of the Clean Water Act granted to the construction and maintenance of forest roads is only applicable to roads which would be used solely for normal silvicultural activities, such as harvesting trees. Because the Forest Service is presently considering to use some of the roads constructed for this proposed timber sale for recreational and/or other uses upon completion of timber harvesting activities, construction of such roads would require a USACOE authorization by issuance of a permit. We recommend that this issue be fully addressed in the final EIS.

In addition, we are concerned with the road closure methods proposed in the draft EIS. We do not believe that the use of water barring as a road closure technique is consistent with the Alaska Forest Resources and Practices regulations (11 AAC 95.320), which specify that roads are to be closed with the removal of all bridges, culverts or fills. Additionally, we do not believe that water barring is consistent with Forest Service BMP 14.24 (Soil and Water Conservation Handbook, FSH 2509.22), which specifies that all temporary and short-term roads are to be obliterated upon completion of their use. We recommend that the final EIS indicate that road closure procedures which are consistent with applicable state regulations and Forest Service direction will be applied in the project area.

### **Purpose of and Need for Action**

#### **Purpose and Need**

It is difficult to determine why a timber harvest volume between 15 and 25 million board feet (MMBF) is explicitly identified in the purpose and need section of the draft EIS. While we understand the purpose and need for the project is to 1) carry out direction in the Tongass Land Management Plan, 2) contribute to providing a sustained volume of wood to meet local and national needs and 3) provide local and regional employment opportunities, the draft EIS does not explain why the specific target volumes associated with this particular sale are necessary to meet those needs.

We believe there are issues related to National Environmental Protection Act (NEPA) implementation that arise by explicitly specifying a harvest volume in the purpose and need section of the draft EIS. For example, in stating that the needed volume from the proposed

project is 15-25 MMBF, the range of alternatives appears to have been limited to those that would meet the identified volumes. Furthermore, in defining specific volumes for this project, we have concerns that critical decisions in the planning process (i.e., determination of the target volume) may have been made without adequate public involvement.

Page 1-5 indicates that the decision of how and when to manage timber resources in the King George study area will be made based on the information contained in the subject EIS. It is not clear that this is entirely true, as the target volumes appear to have already been established. This suggests that some decisions related to timber management in the area have already been made. Were the volumes determined from the analyses contained in Appendix A? If so, how were they derived, and how does their derivation relate to the proposed action being evaluated in this EIS? If not, what process was used to make such decisions, and how does it relate to the NEPA process? This information should be included in the final EIS.

### Permits

In addition to the permitting requirements identified on page 1-6, the proposed log transfer facility (LTF) would need to obtain a National Pollutant Discharge Elimination System (NPDES) permit from EPA under Section 402 of the Clean Water Act. We recommend that you contact Susan Cantor in our Anchorage office (907-271-3413) to initiate discussions related to the potential permitting of the Honeymoon Creek LTF.

### Alternatives

#### Presentation of Alternatives

In the discussion of each alternative, the estimated harvest volume associated with the alternative is presented, along with a statement indicating that a resultant volume would be left for potential future harvest entries. The sum of the alternative harvest volume and that available for potential future harvesting is approximately 30 MMBF. Review of the landscape analysis presented in Appendix A does not provide sufficient information to clearly indicate how the 30 MMBF value has been determined. If the 30 MMBF volume is based on the analyses contained in Appendix A, we believe that it would be extremely valuable for the EIS to include a discussion (and perhaps calculations) of how the potential acres for harvest contained in this analysis translate to estimates of volumes of timber potentially available for harvest. We strongly recommend that the final EIS present a clear discussion of planning activities conducted for the project area and how they relate to the proposed action (and volumes) presented in the EIS. This is fundamentally critical information that should be disclosed in the EIS.

### Mitigation Measures

The draft EIS indicates that Best Management Practices (BMPs) will be used to "ensure that timber harvest activities minimize soil erosion and meet State water quality standards." Please note that the application of BMPs does not necessarily ensure that water quality standards (WQS) will be maintained--they are designed with the intent of achieving that goal. A critical element of BMP application is the evaluation of the effectiveness of the practices employed

through monitoring. This includes both implementation monitoring (were the BMPs applied?) and effectiveness monitoring (did the BMPs achieve the desired goal?). The final EIS should include a discussion of implementation and effectiveness monitoring efforts on the Tongass to substantiate the claim that the BMPs to be applied in the King George area would ensure that Alaska WQS would be maintained. We also recommend that the present monitoring plan (Appendix C) be expanded to include effectiveness monitoring of BMPs applied in the study area in order to 1) demonstrate that water quality and fish habitat are protected in the study area and 2) provide information to support future planning activities and/or BMP refinement.

The draft EIS indicates that Tongass Timber Reform Act (TTRA) mandated minimum 100-foot wide no-harvest buffers will be applied to all Class I streams and those Class II streams flowing directly into Class I streams. The draft EIS also states the "research indicates that these buffers are effective in maintaining the productivity of the freshwater system." While we are aware of a number of studies related to the effectiveness of no-harvest buffers in protecting water quality and fish habitat, we are not aware of any effectiveness monitoring studies related specifically to the effectiveness of the minimum 100-foot buffers employed on the Tongass. We recommend that the final EIS present results of effectiveness monitoring studies to support the contention that use of the TTRA-defined buffers are truly effective in maintaining the quality of the freshwater system.

#### Preferred Alternative

The draft EIS identifies the preferred alternative as Alternative 5, with some modifications. Because the Preferred Alternative proposes to defer the sale of some of the harvest units (for an unspecified period of time), we are concerned that potential impacts from roads for the Preferred Alternative have not been adequately addressed in the EIS. As discussed in the EIS, most roads are expected to be closed about five years after harvest under Alternative 5. Without an understanding of how the Forest Service proposes to defer the sale of certain units, or which roads would remain open beyond five years for Alternative 5, we have concerns that impacts associated with roads being open beyond five years have not been examined or reported in the EIS.

It is difficult to reconcile information presented in the discussion of Alternative 5 (and presumably the Preferred Alternative) and information presented in Table 3-8. The discussion on page 2-2 indicates that most of the available timber (roughly 26 of the available 30 MMBF) would be removed under this alternative, yet Table 3-8 indicates that only 22 percent of the manageable acres in the study area would be treated under this alternative. The former discussion would suggest that little additional harvesting would take place in the foreseeable future (an additional 13 percent of available timber volume) while the latter discussion would suggest that significantly more harvest activity could take place (78 percent of manageable acres would remain available after this entry). We recommend that the EIS clarify these seemingly contradictory characterizations of present and future harvest activities.

## **Affected Environment and Environmental Effects**

### Scenic Resources

In assessing the scenic impacts of the proposed timber sale, the draft EIS presents Figures 3-3 and 3-7 to illustrate how certain views would look with the implementation of selected alternatives. We find these figures to be extremely useful in translating the proposed alternatives into a form that directly relates to the issue of visual impacts. In order to make the EIS a more useful decision-making document, as well as providing greater disclosure of potential impacts to the public, we recommend that the final EIS present similar figures for all proposed alternatives. This would provide the decision-maker and the public a better means of evaluating the impact of each alternative on sensitive viewsheds.

### Freshwater Systems and Estuaries

Text on Page 3-37 indicates that riparian widths within the proposed project area are estimated to vary from 140 to 400 feet (channel plus two sides). Unfortunately, we were unable to determine how these widths relate to the buffers proposed to be used with the implementation of the proposed project. Neither the graphical depictions nor the text on the unit cards indicate that buffers greater than the minimum 100-foot TTRA prescription would be applied. We recommend that this apparent discrepancy be clarified/corrected in the final EIS.

Page 3-37 states that over 60 miles of Class III streams are found within the project area. Unfortunately, the EIS does not indicate that any of these streams will be protected with the use of buffers, as recommended in the AFHA report. It appears that the Forest Service is relying on the assumption that the use of helicopter yarding and partial retention harvest prescriptions are adequate for protecting against adverse impacts to water quality and fish habitat from activities in headwater areas. No information has been presented in the EIS to support that assumption. This lack of information is critical as there are numerous Class III streams within or immediately adjacent to proposed harvest units that feed directly into either Class I or Class II streams. We estimate that there are 10 units (Units 15, 17, 18, 19, 21, 22, 23, 24, 26, 27) within the King George watershed that would be impacting Class III streams and 6 units in the Honeymoon Creek watershed (Units 9, 10, 11, 12, 13, 14) that would be impacting Class III streams. Additional information should be provided in the final EIS as to the effectiveness of the proposed management prescriptions in protecting the freshwater system within the project area.

The draft EIS indicates that King George Creek contains by far the largest and most productive fish habitat in the study area. It also indicates that a fish habitat survey (evaluating large woody debris, pool areas, and width-to-depth ratios) was conducted for King George Creek in 1993-94. The information presented in the EIS provides sufficient information to determine that the King George watershed contains valuable fish habitat and warrants appropriate protections. Unfortunately, comparable information on the Honeymoon Creek watershed is not contained in the EIS. There is no information related to the species of resident fish populations present in Honeymoon Creek, the size of those populations, nor a survey of the habitat in the

drainage. In order to provide the decision-maker and the public with sufficient information to determine the relative impacts of the proposed alternatives, we recommend that additional information be provided in the final EIS related to resident fish populations and habitat in the Honeymoon Creek watershed. From our perspective, the "value" of this watershed has not been disclosed in the draft EIS.

### Alternative Comparison

The EIS presents a good comparison of the relative impacts of each alternative on the freshwater systems and fish habitat within the study area. Based on the information presented, Alternatives 2 and 5 pose the greatest risk to water quality and fish habitat, with road segments 4, 7, and 8 providing the greatest risk to fish habitat. The EIS also includes results of a watershed modeling analysis which shows proposed acres of harvest for Alternative 5 to be less than estimated harvest thresholds. It appears that, based primarily on the watershed modeling results, the draft EIS concludes that "all alternatives are expected to meet the goals of maintaining water quality and aquatic habitat." We believe that the information discussed below is required to support this conclusion:

1. The EIS should present a discussion of applicable Alaska Water Quality Standards (WQS), the condition of the watersheds relative to those standards, and supporting information that water quality will meet these standards with project implementation. Information is also needed to indicate that the implementation of any action alternative would satisfy the anti-degradation element of the Alaska WQS.
2. No information is presented related to the watershed sensitivity model used to evaluate potential impacts from the proposed project. Without an understanding of the basic assumptions used in the modeling, it is difficult to understand the results of the modeling or the conclusions based on those results. We believe that the EIS should present a discussion of the model used which would include a brief description of the basic assumptions used in the model, the inputs needed to apply the model and how they were developed for this analysis, and the outputs generated by the model.
3. Results of effectiveness monitoring efforts have not been presented in the EIS. It is, therefore, difficult to determine if the management practices to be applied with project implementation would truly protect fish habitat and water quality. The EIS should include findings of effectiveness monitoring studies to support the contention that the management practices to be applied will truly protect the freshwater system.

### Habitat Conservation

As in the discussion on Freshwater Systems and Estuaries, we are concerned with the general lack of evaluation of impacts on the habitat values in the Honeymoon Creek watershed. The EIS indicates that the Honeymoon Creek watershed is used less than the King George corridor and the reader is left, apparently, to conclude that it is therefore not important from a

wildlife habitat perspective. Figure 3-20 would suggest that the old growth block which presently includes both the King George and Honeymoon Creek watersheds may provide an important east-west travel corridor for north Etolin Island. Information on the road design cards confirm this in stating that the Honeymoon Creek drainage is one of the major large mammal travel corridors in the study area. We were unable to locate information in the EIS that discussed and evaluated this corridor in any detail. In order to provide the decision-maker and the public with sufficient information to evaluate the consequences of constructing roads and harvesting timber in the Honeymoon Creek watershed, we recommend that the EIS provide additional information on the significance of potential activities in the Honeymoon Creek watershed on habitat values and wildlife.

United States  
Department of  
Agriculture

Forest  
Service

Alaska Region Tongass National Forest  
Stikine Area  
P.O. Box 309  
Petersburg, AK 99833

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File Code: 1950

Date: August 1, 1996

Richard B. Parkin  
U.S. Environmental Protection Agency  
Region 10  
1200 Sixth Avenue  
Seattle, Washington 98101

Dear Mr. Parkin:

I appreciate the thoroughness and detail of the EPA comments on the King George Timber Sale DEIS. Meg Mitchell and Julianne Thompson found it very useful to discuss preliminary EPA comments during a recent telephone conversation with Bill Ryan, which served to clarify some project-specific issues. Our response follows the same sequence and headings as your comments.

#### Roads

I am aware of continuing negotiation between the Forest Service and the US Army Corps of Engineers regarding the "silvicultural exemption" from Clean Water Act Section 404 permitting processes. Current Forest Service policy is to claim this exemption for all roads which are built for the primary purpose of conducting silvicultural activities such as timber harvest. The entire King George road system fits this definition. The Corps did not comment on the DEIS and we have no reason to believe that they are expecting a change in this policy for the King George road system. Nevertheless, the FEIS contains sufficient detail for such a permit should one be necessary.

The selected alternative uses a variety of road "closure" techniques in the King George Timber Sale area and the FEIS contains additional information (Appendix F) which clarifies the site-specific measures to be employed. We received a lot of comment on this topic. Developing a reasonable long-term road management strategy was a major focus of ID Team discussion between Draft and Final EIS's. An additional field review of the road system was conducted to evaluate the suitability of drainage structure design options under different road management strategies. The road management strategy selected is consistent with both the Alaska Forest Resources and Practices regulations and the Forest Service BMPs. Some road segments will be obliterated by blocking motorized access, removing drainage structures and restoring natural drainage. Some road segments will be administratively closed to motorized access by installing a gate which would provide for routine road maintenance activities.





## Purpose of and Need for Action

The harvest volume range was determined by the landscape and planning area analysis summarized in Appendix A. Our conclusions regarding harvest volumes have been more explicitly explained at the end of Appendix A in the FEIS. A maximum number of "harvestable acres" was determined for each land unit given that we wanted to maintain certain ecological functions and human resource values. The minimum harvest scenario utilized all helicopter harvest to harvest the "maximum harvestable acres" within only those land units that were located one mile from saltwater (an economic threshold). Given the high cost of helicopter methods, a "maximum harvestable acreage" within one mile of saltwater for each land unit was assumed in order to ensure the project is saleable (if we can't sell the sale, it won't meet the purpose and need). The maximum harvest scenario used a combination of roads and helicopter to harvest most of the "maximum harvestable acres" within each land unit. Harvestable acres were converted into volume estimates by calculating the volume derived as a function of a) volume class, and b) its location on the landscape and how much green tree retention we wanted to leave. Public values and input were considered in this analysis at two points: 1) public scoping on the project had been completed prior to the final version of this analysis and helped us identify the desired conditions for each land unit, 2) the minimum and maximum harvest scenarios were developed from the range of public input. Some people told us they wanted to see an "all helicopter" sale while others told us they wanted to see a "maximum harvest" sale. Later these scenarios were refined into more specific alternatives (Alternatives 1 and 5). Other alternatives were developed around NEPA issues which considered lighter harvest or deferral in some land units. In this way, all alternatives are responsive to the desired conditions we wanted to maintain in each land unit (based on the Forest Plan), while also being responsive to key issues through the NEPA process. The maximum development proposal was put forth as the proposed action so that the public would have a chance to comment on the full range of units and roads we considered. A modification of this alternative became our preferred alternative based on public comment (see the Record of Decision).

## Permits

The LTF permit process has been initiated. Please note that the LTF for the King George Timber Sale is called Zimovia Strait LTF. Although we recognize that the State and federal agencies view the permit process as separate from the NEPA process, we need to know about any NEPA issues which would affect the permitting of this site during the comment period of this DEIS. In this way, we are best able to respond to any substantive concerns before a ROD is issued. We have added that EPA regulates the National Pollution Discharge Elimination System permits on page 1-6.

## Presentation of Alternatives

The amount of volume possibly available for future harvest was described with each alternative in order to show the potential tradeoffs to future management (mainly small sales and implications to road system management). Further NEPA would be necessary to propose this volume for harvest. Our estimate at this



time is that about 30 MMBF is available for harvest within the 50 year period given today's harvest economics and desired conditions. Only about 25 MMBF is available this entry in order to satisfy the desired conditions outlined in Appendix A.

### Mitigation Measures

The reasonable implementation of BMPs, in conjunction with monitoring and feedback to ensure appropriate corrective action is taken on observed water quality degradation, in effect achieves compliance with the intent of the Clean Water Act and State water quality standards. BMPs for the King George Timber Sale are designed specifically to maintain the State-designated beneficial use of waters in and around the study area. In this case, the beneficial use is the growth and propagation of fish, shellfish, other aquatic life, and wildlife in both marine and fresh waters. The ID Team considered results of past BMP implementation monitoring on the Stikine Area to refine the application of BMPs in the King George study area. This is discussed in Appendix E.

The FEIS monitoring plan (Appendix C) includes an expanded discussion of both BMP implementation and BMP effectiveness monitoring. I have also enclosed a report explaining in detail some of the findings from past BMP implementation monitoring. Results show that at least minimal BMP compliance is achieved about 90% of the time. Many of the noncompliance issues resulted from inadequate field verification during planning. The ID Team addressed this finding by substantially increasing the level of field verification of water quality and fish habitat concerns in the study area.

A buffer effectiveness monitoring project (partially funded by EPA) is underway on the Tongass National Forest. Permanent monitoring sites were recently established in buffers in the Campbell Timber Sale (Bradfield Canal area). Baseline stream morphology and habitat data has been collected at these and many other buffered streams across Southeast Alaska. In addition, I call your attention to citations in Chapter 3 which describe the inherent value of buffers in maintaining healthy riparian areas and streams. Some of these papers describe buffers in the "lower forty-eight" but TTRA buffers have the same attributes.

### Preferred Alternative

Alternative 5 was identified as the preferred alternative but we indicated that we were considering some refinements to it between DEIS and FEIS to indicate a possible area of comment for the public. We have since refined Alternative 5 (and Alternative 2) to respond to public comments and issues regarding small sales, visual quality, road management and water quality. Unit design modifications affect all alternatives, including Alternative 5. The effects of these changes have been fully disclosed in this FEIS.

The "manageable acres" (second figure) includes all the remaining commercial forest land that is technically and biologically capable of supporting timber harvest. We have modified this table to reflect the acres available after all protective buffers and old growth retention blocks have been subtracted.





However, only a portion of this area is anticipated to be both economically feasible and desirable to harvest within the next 50 years. Timing considerations (to meet habitat and visual resource objectives) and harvest economics account for the differences between the potential of the area to support harvest, and the reasonable foreseeable volume anticipated to be removed in the next 50 years. Essentially, 1/3 of the manageable acres will be harvested under Alternative 5 but only an additional 4 MMBF of it is expected to be harvested in the next 50 years in order to meet the desired conditions outlined in Appendix A. The suitability and operability Chart in Chapter 2 also helps describe the land base acreages.

### Scenic Resources

Since Alternatives 2 and 5 are the only alternatives that impact the Stikine Strait viewshed, the sketches in the FEIS are adequate. The ID Team liked your suggestion for the Honeymoon views as it is clear from public comment that many are concerned about this particular view and the DEIS only included a sketch of Alternative 5. The FEIS includes sketches of the modified Alternative 5 and Alternatives 1, 3, and 4, along with the existing condition which will be maintained under Alternatives 2 and 6. The FEIS also includes a sketch of the proposed Zimovia Strait LTF as compared to Earl West LTF since these concerns were also raised during comment (see Appendix D).


### Freshwater Systems and Estuaries

The use of the riparian model was a source of confusion for several commenters. The FEIS includes some clarification of this matter. The riparian model was not used to design buffers. It was used to identify potential overlaps between riparian areas and units or roads outside of the minimum 100-foot TTRA buffer. Potential overlaps were given high priority for field verification. Generally, field verification resulted in finding that the riparian area was adequately protected by the 100-foot buffer. In most cases, the modeled riparian area did not overlap with proposed roads or units. Buffers wider than 100 feet often result from a combination of logging systems operability, logical unit boundaries at the edge of merchantable timber stands, and riparian protection.

The FEIS contains information about Class III stream protection. It is not possible to design a reasonable timber sale which excludes all Class III streams from harvest units. Our stream protection BMPs are consistent with State forest practices regulations, and we expect minimal channel disturbance during harvest activities. Visual observations during BMP implementation monitoring indicate that where streams are mapped and flagged for appropriate protection, this expectation is met. The level of field verification that went into these units ensures that streams are mapped and flagged appropriately. Relatively speaking, there is a greater risk of Class III stream disturbance and sediment transport associated with road construction and maintenance than with felling and yarding. This is why the ID Team devoted a great effort to road design and a long term road management strategy.

The FEIS clarifies some key differences between the freshwater systems (specifically aquatic productivity) of King George Creek and Honeymoon Creek while attempting to minimize the bulk of the document. The ID Team provided





detailed descriptions of both watersheds so the public and the decision-maker could discern the relative values of each. Both watersheds received intensive field verification to determine the extent of fish habitat as well as protection needs associated with roads and harvest units. Because the habitat quality (and anadromous fish production) was much higher in King George Creek it was selected for a detailed habitat survey. Limited funds prevent fisheries staff from conducting such surveys on all streams prior to timber harvest. In this case, funding was available to conduct a detailed habitat survey in support of anadromous fish habitat enhancement opportunities in King George Creek.

#### Alternative Comparison

The FEIS provides additional information on applicable Alaska Water Quality Standards. No water bodies in Alaska have been designated for additional protection beyond the requirement to maintain existing beneficial uses. The Forest Service is committed to meeting this requirement through the application and monitoring of BMPs as described in the FEIS and in the Forest Service's Memorandum of Agreement with the Alaska Department of Environmental Conservation.

The FEIS provides additional information about the watershed sensitivity model. I have enclosed a copy of the citation for your reference. For this project, the model was used only to identify subwatersheds with potentially low harvest thresholds and demonstrate that those thresholds were not exceeded in any alternative.

As stated earlier in this response, the FEIS contains more information about effectiveness monitoring.

#### Habitat Conservation

King George and Honeymoon watersheds were not directly compared in the habitat conservation section the way they were in the freshwater system section because the watershed is not always a relevant unit of analysis when considering this issue. The discussion on fragmentation and corridors discusses mainly the effects of alternatives on the block reserved near King George because this block has a much higher value (it is larger; lies adjacent to more anadromous fish stream; contains floodplain channel types that contribute a wider riparian corridor and lies adjacent to the largest estuary). This is why this area was chosen for old growth retention and why we discussed the impacts of the alternatives on the selected retention strategy. The FEIS describes the effects of the alternatives on the habitat values located on the Honeymoon side. Effects on the corridor to Honeymoon are described in the Chapter 3 section on Travel Corridors, habitat values for MIS are depicted in maps and tables, and the effects on the "honeymoon stand" and south-facing old growth blocks are disclosed in the section on Unique or Special Habitats.





Richard B. Parkin

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I believe the FEIS has addressed the EPA's three main concerns by 1) clarifying road management strategies and "closures," 2) better explaining the tie between the acreage and volume figures in the Purpose and Need and Appendix A, and 3) expanding or clarifying the information about fish and wildlife habitats in Honeymoon Creek.

Thank you again for your response and interest in this project.

Sincerely,



ABIGAIL R. KIMBELL  
Forest Supervisor

Enclosures



## STATE OF ALASKA

TONY KNOWLES, GOVERNOR

## OFFICE OF THE GOVERNOR

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June 24, 1996

Ms. Abigail R. Kimbell  
Forest Supervisor, Stikine Area  
Tongass National Forest  
P.O. Box 309  
Petersburg, AK 99929

SUBJECT: KING GEORGE TIMBER SALE  
SID #AK9604-26JJ  
PROPOSED CONSISTENCY FINDING

Dear Ms. Kimbell:

The Division of Governmental Coordination (DGC) has coordinated the State's review of the U.S. Forest Service's (FS) consistency determination for the King George Timber Sale. The FS found the harvest activity consistent, to the maximum extent practicable, with the Alaska Coastal Management Program (ACMP).

This project proposes the harvest of between 14.1 and 26.6 million board feet (MMBF) of timber from approximately 900 to 1,357 acres within the King George Project Area, located on the northern end of Etolin Island, about 10 miles south-southwest of Wrangell. Between 0 and 12.7 miles of road would be constructed in the Honeymoon and King George Creek valleys. The purpose of the project is to (1) carry out direction in the Tongass Land Management Plan, (2) contribute to providing a sustained volume of wood to meet local and national demands and (3) provide local and regional employment opportunities. Associated with this project is the construction of a log-transfer facility with a low-angle ramp, which would also be constructed just north of Honeymoon Creek. This new facility will undergo a separate review for consistency with the ACMP and will be subject to a DEC 401 Certificate of Reasonable Assurance.

The format and writing style of the King George DEIS were both informative and constructive, and the State was pleased with the range of alternatives presented and the large amount and variety of uneven-aged management prescriptions proposed for the majority of the units.

The FS has selected Alternative 5 as the preferred alternative for this project. This proposes

the harvest of 26.6 MMBF from 1,357 acres, and the construction of 12.7 miles of road. This is the maximum harvest alternative.

### Consistency Finding

The State has three broad areas of concern for coastal resources affected by federal timber harvest activities: fish and fish habitat; wildlife and wildlife habitat; and water quality. The State enforceable policies that address these concerns are found in the Alaska Forest Resources and Practices Act (FPA) and its implementing regulations. The State reviewed the proposed timber harvest activity to determine if state coastal resource concerns are adequately addressed and to determine if the State agrees that the activity is consistent, to the maximum extent practicable, with ACMP enforceable policies.

The State disagrees that the preferred alternative is fully consistent with the ACMP. Given that the project is still at the DEIS stage of review, and a degree of flexibility remains in the FS decision-making process, the State has developed alternative measures that, if adopted, would allow the activity to proceed consistently with the State's coastal management program.

### Roads

Road closures provide a measure of protection to water quality, and fish and wildlife resources. According to the FS, obliteration of temporary roads on national forest lands is the equivalent of road closure on State lands. Regardless of the nomenclature, when the FS closes, or obliterates a road, it must be done consistently with 11 AAC 95.320. Roads that are inactive and are not obliterated must be maintained consistently with 11 AAC 95.315(c).

As described in the DEIS, maintenance level 1 for specified roads is inconsistent with the standards of 11 AAC 95.315(c) and 95.320. Depending on the alternative, various amounts of road closure are proposed following completion of this timber sale. No detailed descriptions are provided to detail what these closures will provide. Due to repeated statements that mention periodic maintenance needed to keep culverts functioning, we are assuming that most drainage structures will be left in-place.

Although periodic maintenance is prescribed for these structures, according to the road cards, all of the roads will be closed by water barring to prevent vehicle passage. Consequently, routine maintenance may be difficult to perform since vehicular access to these structures will be blocked. As indicated below (discussion of road segments 4 and 8), this presents significant concerns for crossing structure failure and associated impacts to water quality, especially for those culverts that have been identified as having a high risk for structure stability and maintenance.

The road closure standards of 11 AAC 95.320 are very specific and require the removal of all bridges, culverts and fills, outslipping or water barring the road surface, and leaving ditches in a condition suitable to reduce erosion. To be consistent with the ACMP and to minimize the risk of water quality degradation and downstream fish habitat, road closures or obliteration must be conducted consistently with 11 AAC 95.320. If the Forest Service subsequently

indicates that these roads will actually be inactive, rather than closed, then the road maintenance standards of 11 AAC 95.315(c)(1-3) will apply. Specifically, these include: (1) keeping ditches and drainage structures maintained as necessary to assure water flow and fish passage; (2) keeping the road surface crowned, outsloped, water barred, or otherwise left in a condition not conducive to erosion; and (3) keeping ditches and drainage structures clear and in good repair.

#### Specific Road Segments:

Segment 4: This segment extends from Honcymoon Pass to King George Creek and has been given a high risk rating for sediment transport to fish habitat. The DEIS states that the two Class III streams have the potential to block culverts due to debris transport. Risk to downstream fish habitat is mentioned with the recommendation that oversized structures and maintenance will be needed. This road is proposed to be closed under Alternative 5, however, no mention is made for the removal of the culverts. If this segment is constructed, it is critical that structures be removed during road closure, consistently with 11 AAC 95.320, to eliminate the potential for road washout and impacts to downstream water quality within the Class I habitat of King George Creek. Bridges are the preferred crossing structure if the road is placed in inactive status, or is used periodically over the long-term to provide access for silvicultural or other administrative purposes. Use of bridges will be consistent with 11 AAC 95.300(a)(7) which states, "in deep V-notches or in drainages where a culvert may require substantial fill, a bridge is the preferred crossing structure, if feasible."

Segment 5: This segment will access the eastern portion of Unit 18 directly above and on the north side of King George Creek. Poorly drained soils, including "blue clay" are located here, along with historical landslide tracts and evidence of past slope failures. It is likely that a slope failure here could allow sediment to enter into King George Creek. The high potential for slope failure and direct impacts to the water quality and fish habitat of King George Creek indicate that this road should not be constructed. This will ensure consistency with 11 AAC 95.290(a), and 11 AAC 95.280(d)(1). If the FS elects to implement Alternative 5, then Unit 18 could be harvested entirely by helicopter to prevent the need to build the road to access this unit.

Segment 8: This road parallels King George Creek and accesses the middle and lower portions of the watershed. It has been given a high risk rating for sediment transport to fish habitat. As depicted on the road card map, culvert installations are proposed for at least eight streams that are crossed by the alignment and are directly tributary to the Class 1 habitat of King George Creek. The road card narratives depict two of these streams as being sizable and relatively unstable. The Watershed/Fisheries report indicated that the first of these ("Hydro site #1") contains an avalanche and stream runout depositional area between Units 24 and 25. The second stream located between Units 25 and 26 has a high risk for structure stability and maintenance with large debris and bedload transport. A poor approach alignment is noted for the approach on the west side (out of the notch).

The Access Management report states that this road segment will be closed under Alternative 5. It is essential that the crossing structures be removed upon completion of harvest activities

consistently with 11 AAC 95.320. However, as with Segment 4, if this road is intended to provide periodic access over the long-term, then bridges should be installed at these crossing sites rather than culverts (11 AAC 95.300(a)(7)).

This segment will also cut through "deep stratified sand deposits" in the vicinity of Unit 24, which are inherently unstable and pose a high risk of chronic cutslope failure and blockage of ditchlines. These sand deposits are especially significant given their relatively close proximity to the mainstem of King George Creek, and their association with the apparently unstable "Hydro site #1" stream. Special practices, such as riprapping or ballasting the cutslopes, along with the standard revegetation practice will minimize sloughing and ditchline blockage.

### Water Quality and Fish Habitat

Several of the proposed units within the King George Creek watershed present concerns for fish habitat and water quality due to slope instability and blowdown of reserve trees. Specifically, these units include the following:

#### Unit 17 :

There is extensive windthrow within this unit. An island of unharvested timber is proposed to be retained within section A of the unit, just north of and in close proximity to the Class III stream at the southern unit boundary. This is the same stream that was identified in the road card narrative for Segment 4 as having large debris and bedload transport concerns. Given its position on the landscape, this island will be highly susceptible to windthrow which, should it occur, could initiate a slide into this Class III tributary, which may result in a debris torrent to King George Creek. Therefore, to better minimize the risk of blowdown-induced slope failure, this island either should not be retained, or it should be relocated farther north within the unit at a location where a potential slide will be less likely to enter surface waters. [AS 41.17.060(b)(5), (c)(5)].

#### Unit 18 :

This unit is located on steep slopes directly above and on the north side of King George Creek, and has been given a high risk of sediment transport to fish habitat (Table B-1). This area has "steep, deeply-incised streams (V notches)" that "are especially efficient at rapidly transporting sediment from unstable sideslopes or during debris flows." In addition, "numerous old landslide scars" are present and are indicative of the inherent slope instability of this area. According to the unit card, the upper slopes of this unit "have somewhat poorly drained soils underlain by basal till [blue clay]. The risk of mass movement for these soil types is high. Slopes are generally 40-65% with some areas exceeding 75%."

In addition to the slope stability concerns within the unit, it appears that a slope break buffer will be retained along the top of the "very large and deep" Class III V-notch which forms the western unit boundary and is directly tributary to the Class I habitat of King George Creek. Given the reported higher risk of windthrow within this portion of the King George Creek drainage (DEIS page 3-44), a significantly high potential exists that this buffer will blow

down into the notch, which may result in slope failure and a channel scouring debris torrent to King George Creek. Similar concerns for blowdown and associated potential slope failure exist for the long, narrow island of unharvested timber to be retained in section B of the unit.

Sedimentation resulting from harvest in this unit could result in detrimental effects to water quality and fish habitat. The DEIS describes King George Creek as being the most productive fish stream in the project area in terms of species richness and escapements. Given the inherent slope instability of this area and the high potential for sediment delivery to adjacent King George Creek, we believe this unit should be dropped from harvest consideration. However, if it remains in the selected alternative, harvest of the western portion of the unit (sections A and B) should be deleted, and harvest of the eastern portion (sections D and E) should be entirely by helicopter, thereby eliminating the need for road segment 5 (as discussed above under Roads). [AS 41.17.060(b)(5), (c)(5), (c)(7)].

#### Unit 22 :

This unit contains eight Class III streams that are directly tributary to the Class I habitat of King George Creek located immediately adjacent to the lower unit boundary. Two small islands of unharvested timber are proposed to be retained within the unit, each of which encompass a Class III stream. Depending on the direction and intensity of winds within this area, these islands may be susceptible to blowdown which, depending on its extent, may create a source of sediment delivery to King George Creek through upturned rootwads and destabilized sideslopes and stream banks. The windthrow potential within this unit should be investigated prior to establishing these two islands. [AS 41.17.060(b)(5), (c)(5)].

#### **Fish Stream Crossings:**

Fish stream crossings can have a detrimental impact on fish populations if they are improperly designed and placed. There is currently insufficient information to review fish stream crossings for consistency with the ACMP and to ensure State concerns are addressed. The State will discuss this issue at a later date to determine what level of information is necessary and the State review procedure.

#### **Wildlife Habitat:**

The chief wildlife travel corridor between King George and areas to the south on Etolin Island is the Red Mountain old growth block. The preferred alternative schedules a large harvest (unit 28) of about 140 acres blocking that corridor. Sections A and D with 50% retention, Section C with 70% retention, and Section B with only 30% retention. All of Section B, unit 28 should be group selection with at least 50% retention in order to provide for this important wildlife travel corridor. [41.17.060(c)(7)].

Please be advised that although the State has completed its response to your consistency determination, you are still required to meet all applicable State and federal laws and regulations. This finding may include reference to specific laws and regulations but this in no way precludes

your responsibility to comply with other applicable laws and regulations.

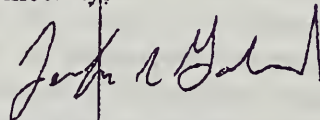
If the FEIS and final decision for this project is substantially different than the project described in the DEIS and as modified by the tentative decision, the FS should provide the State with a revised consistency determination for further State review.

If changes to the project are proposed prior to or during its siting, construction, or operations, you are required to contact this office immediately to determine if further review of the revised project is necessary.

Should cultural or paleontological resources be discovered as a result of this activity, we request that work which would disturb such resources be stopped, and that the State Historic Preservation Office be contacted immediately (269-8720).

If you have questions or comments regarding this proposed consistency finding, please call (907) 465-3177.

Sincerely,



Jennifer R. Garland  
Project Review Coordinator

cc:

\*\* Jim Ferguson, DEC, Juneau  
\*\* Phil Mooney, DFG, Sitka  
\*\* Lana Shea Flanders, DFG, Juneau  
\*\* Tom Paul, DFG, Juneau  
\*\* Lisa Weissler, DGC, Juneau  
\*\* Bob Palmer, DNR, Juneau  
\*\* Jim McAllister, DNR/DOF, Juneau

\*\*=email

# MEMORANDUM

## STATE OF ALASKA DEPARTMENT OF FISH AND GAME HABITAT and RESTORATION DIVISION

TO: Jennifer Garland  
Project Coordinator  
OMB-DGC

DATE: June 4, 1996

FILE NO: AK 9604-26JJ

TELEPHONE NO: 747-5828

SUBJECT: King George Timber Sale  
DEIS

FROM: Phil Mooney  
Area Habitat Biologist  
Stikine/Yakutat Area

The Alaska Department of Fish and Game has reviewed the Draft Environmental Impact Statement (DEIS) for the US Forest Service's proposed King George Timber Sale on Etolin Island. This sale, which may be offered to both small and large timber operators, proposes to harvest between 14.1 and 26.6 MMBF of timber from approximately 900 to 1300 acres. Construction of between 0 and 12.7 miles of road, depending on alternative, will be necessary. In addition, a drive down log transfer facility (LTF) is proposed in conjunction with the roaded alternatives (2 through 5) at a location along Zimovia Strait, approximately 2600 feet north of Honeymoon Creek. This facility will undergo a separate Alaska Coastal Management Program (ACMP) consistency review. The information and recommendations contained herein are intended for use in the interagency development of a consolidated State response. We look forward to working with your office and other departments in developing that response.

We have provided detailed comments [November 29, 1993] on the scoping document for this proposed timber sale. We include these earlier comments by reference into this response.

Overall, we are pleased to see the range of alternatives that are presented in the DEIS and the large amount and variety of uneven-aged management prescriptions that are proposed for the vast majority of the units. The concise format and tone of the document is constructive and appreciated. We do, however, have concerns regarding the selection of the preferred alternative, wildlife travel corridors, retention, roads, fish habitat protection, old growth and fragmentation.

### Selection of Alternative 5 as the Preferred Alternative

The Forest Service has identified Alternative 5 as the preferred alternative. This alternative proposes to harvest approximately 26.6 MMBF of timber from 1,357 acres, and to construct a total of 12.7 miles of specified and temporary road. A LTF north of Honeymoon Creek would be used. According to the DEIS, this is the maximum harvest alternative and will remove most of the available timber volume.

The department has offered extensive comments and suggestions to the IDT throughout the planning process so far. The approach of the IDT has been encouraging in the way it has looked at the King George area and Etolin Island as a whole and addressed some of the sale issues on a landscape basis more than typical timber sale planning teams have. It has also presented a desired future condition for the project area that may serve to guide future activities there. Nevertheless we are disappointed in the final product. The selection of a maximum timber alternative as the preferred alternative in this LUD III area demonstrates that timber considerations still drive the planning process.

According to the DEIS, Alternative 5 was selected as the preferred alternative primarily because it has the greatest potential to be divided among large and small operators. But, as the DEIS admits on page 3-68, the preferred alternative would eliminate 33% of the existing old growth wildlife habitat in the first entry. We believe this is inappropriate in a LUD III area.

This alternative also poses the greatest relative risk to water quality within the highly productive and sensitive King George Creek Watershed. For example, according to the DEIS (Tables B-2 & B-1), 79 percent (4.7 miles) of the roads to be constructed, and 36 percent (159 acres) of the units to be harvested within this watershed have been rated as having a high risk of sediment transport to fish habitat. This level of risk is particularly disproportionate given the high fisheries values of King George Creek, which the DEIS describes as being the most productive fish stream in the project area [in terms of species richness and escapements (page 3-42)].

### Travel corridors

Although we agreed with the IDT that the chief wildlife travel corridor between King George and areas to the south on Etolin was the Red Mountain old growth block, the preferred alternative schedules a large harvest unit (28) of about 140 acres blocking that corridor. About half the unit is to be harvested by group selection but the rest will have 50% or less retention. All of unit 28 should be group selection with 70% retention or this unit should be dropped in the ROD.

### Retention

Many units are planned to have an "alternative" silvicultural prescription of 30% retention. We believe these will have little benefit over clearcuts to wildlife species other than perhaps, cavity nesting birds. These units will essentially be clearcuts with a few scattered defective trees remaining in them which will be subject to

windthrow. We believe it would be far more beneficial to wildlife to make clearcuts 30% smaller in order to retain more old growth habitat surrounding them with interior forest conditions to benefit old growth dependent species and cavity nesting birds. Retention of less than 50% of a unit's basal area is not likely to be of much benefit to many species of concern. Perhaps retention of only 30% can mitigate some negative effects for soils or visual concerns but it is unlikely to help wildlife.

We note that although the DEIS claims retention of only 30-60% of trees in a timber harvest unit will benefit some species of wildlife it provides no evidence or citations for that assertion. Neither does it propose any monitoring program to test this hypothesis.

### Roads

Roads are poorly labeled throughout the DEIS which makes reviewing of locations and prescriptions extremely difficult and time-consuming. We continue to recommend that all roads in the project area be closed (blocked with drainage structures removed) immediately after logging operations end to maintain wildlife refugia and to mitigate detrimental effects to road sensitive species, e.g. bears, wolves, and martens. See our specific comments below.

### Fish Habitat Protection

In light of the high fisheries values of King George Creek and the concerns for slope failures, poorly drained soils, historic landslide/avalanche activity (see the discussions in the following sections) and concerns for the proposed road construction, we highly recommend against implementing Alternative 5 as the selected alternative for this project. According to the DEIS, this alternative is the least environmentally preferred of all the alternatives in terms of potential risk to aquatic habitat, primarily because of its entry into the King George Creek watershed. Alternative 4, on the other hand, avoids entering this watershed and poses the least risks to water quality and fish habitat of all the roaded alternatives, while still providing a positive economic return and opportunities for small timber operators. Consequently, we strongly urge the FS to adopt Alternative 4 as the selected alternative for the FEIS/ROD.

### Old Growth and Fragmentation

The DEIS discusses the uniqueness of the Honeymoon Creek volume class 7 stand, the only one of its kind left uncut on the Wrangell Ranger District. We have persistently argued in scoping and pre-scoping meetings and communications with the IDT for the importance of retaining this stand. If part of the stand must be cut we asked that cuts be located on the edges of the stand to minimize fragmentation of it. The preferred alternative would harvest almost 40 percent of this rare stand while building a road through the middle of the stand lengthwise. It is not clear whether the 24 acres to be harvested include the acres lost to right-of-way clearing.

Some attempt has been made to reduce fragmentation of the cutting units by putting them below the road. However, the uniqueness of this stand argues for retaining much more of it than proposed in the preferred alternative. We continue to oppose putting the road on the north side of Honeymoon Creek; a road on the south side as in Alternative 2 would reduce fragmentation of this stand. What is also disappointing is that the desired future condition described in Appendix A seems to consign most of this stand to the chopping block in the future. With more than 50% of the highest volume stands in the Tongass already liquidated, the FS needs to begin treating these stands as more than sources of high quality timber. It needs to begin recognizing their value to biodiversity as unique habitat types and as rare examples of ecosystem productivity.

#### Proportionality

The Forest Service's typical method for determining proportional harvest of volume classes was deemed illegal in the Kelp Bay decision in April 1994 because it was arbitrary and capricious. Yet in every timber sale project currently before us for review (Upper Carroll, Eight Fathom, Northwest Baranof, Lab Bay, Control Lake, Port Houghton, Shamrock) the Forest Service has continued to use this arbitrary and capricious method. The prime reason for mandating proportional harvest was to avoid disproportionately cutting the most important wildlife habitat early in the rotation thereby endangering biodiversity and reducing the yield of the wildlife resource unnecessarily early. In the King George timber sale, the Forest Service needs to use a legal method for determining TTRA proportionality.

#### Specific road segment and unit comments

##### Road Segments

Segment 4: This segment extends from Honeymoon Pass to King George Creek. It has a high risk rating for sediment transport to fish habitat. The DEIS (page 3-30), says that the two Class III streams have the potential to block culverts due to debris transport. Risk to downstream fish habitat is mentioned with the recommendation that oversized structures and maintenance will be needed. Under Alternative 5, the road is proposed to be closed. No mention is made for the removal of the culverts. The road card characterizes one of these crossing sites as *"waterfalls up and downstream of crossing, large debris and bedload transport make this site high risk for structure stability and maintenance" ... "Greater than average risk associated with plugging and failure of V-notch crossing at southern boundary of Unit 17."*

If this road segment is constructed, it is critical that these structures be removed during road closure (as required by **11 AAC 95.320**) to eliminate the potential for road washout and impacts to downstream fish habitat and water quality within the Class I habitat of King George Creek. We strongly recommend that bridges (rather than culverts) be installed if the road will be left in-place over the long-term. This is required to be fully consistent with **11 AAC 95.300(a)(7)**, which states **"in deep V-**

**notches or in drainages where a culvert may require substantial fill, a bridge is the preferred crossing structure, if feasible."**

Segment 5: This segment will access the eastern portion of Unit 18 directly above and on the north side of King George Creek. According to the road card, poorly drained soils, including "blue clay" are located here, along with historical landslide tracts and evidence of past slope failures. It is likely that a slope failure here could allow sediment to enter into King George Creek. Due to the soil characteristics and steep slopes, the risks for slope failures to impact fish habitat and water quality of King George Creek should be avoided and the road segment should not be constructed. This unit could be helicopter logged to prevent the need to build the road to access the unit.

Segment 8: This road parallels King George Creek and accesses the middle and lower portions of the watershed. It has a high risk rating for sediment transport to fish habitat. According to the DEIS (page 3-33), *"This segment crosses several Class III streams that have the potential to produce enough debris to block culverts and lead to possible erosion and road washouts. One large stream crossing is particularly high risk."*

As depicted on the road card map, culvert installations are proposed for at least eight streams that are crossed by the alignment and are directly tributary to the Class I habitat of King George Creek. The road card narratives depict two of these streams as being sizable and relatively unstable. The Watershed/Fisheries report indicated that the first of these ("Hydro site #1") contains an avalanche and stream runout depositional area between Units 24 and 25. The second stream located between Units 25 and 26 has a high risk for structure stability and maintenance with large debris and bedload transport. A poor approach alignment is noted for the approach on [the] west side (out of notch).

The Access Management report stated that the road segment will be closed under Alternatives 2 and 5. A gate or some other type of closure at the bridge that crosses King George Creek is proposed, or by blocking the road near the pass (by unit 15) with large boulders. As no mention is made of culvert removal, we assume that these "high risk" structures are intended to remain in place following completion of sale activities.

We recommend that this road segment not be constructed. However, if it is, then it should be required that crossing structures be removed upon completion of harvest activities. This is also necessary to be consistent with the road closure standards of **11 AAC 95.320**, which require the removal of all drainage structures and their associated fills. However, as with Segment 4, if this road is intended to provide periodic access over the long-term, then bridges should be installed at these crossing sites rather than culverts [**11 AAC 95.300(a)(7)**].

An additional concern for this segment is that, according to the Soils/Geology report, it will cut through "*Deep stratified sand deposits*" in the vicinity of Unit 24, which are inherently unstable and pose a high risk of chronic cutslope failure and blockage of ditchlines. These sand deposits are especially significant given their relatively close proximity to the mainstem of King George Creek, and their association with the apparently unstable "Hydro site #1" stream. Special practices, such as riprapping or ballasting the cutslopes, along with the standard revegetation practice will be required along this segment to minimize sloughing and ditchline blockage. However, as indicated above, we would prefer that this area be avoided altogether by not constructing this road.

### Units

Several of the proposed units within the King George Creek watershed present concerns for fish habitat and water quality relative to slope stability and blowdown of reserve trees. We believe this is an ACMP issue relating to **AS 41.17.060(b)(5)** and **(c)(5)** which state, respectively, "**significant adverse effects of soil erosion and mass wasting on water quality and fish habitat shall be prevented or minimized**" [(b)(5)], and "**there may not be significant impairment of the productivity of the land and water with respect to renewable resources**" [(c)(5)]. Specifically, these units include the following:

Unit 17: According to the unit card, "*There is extensive windthrow*" within this unit. Despite this finding, an island of unharvested timber is proposed to be retained within section A of the unit, just north of and in close proximity to the Class III stream at the southern unit boundary. This is the same stream that was identified in the road card narrative for Segment 4 as having large debris and bedload transport concerns. Given its position on the landscape, this island will be highly susceptible to windthrow which, should it occur, could initiate a slide into this Class III tributary, which may result in a debris torrent to King George Creek. Therefore, to better minimize the risk of blowdown-induced slope failure, this island either should not be retained, or it should be relocated farther north within the unit at a location where a potential slide will be less likely to enter surface waters.

Unit 18: This unit is located on steep slopes directly above and on the north side of King George creek, and has been given a high risk of sediment transport to fish habitat (Table B-1). The DEIS (pages 3-44 & 3-45) characterizes this area as having steep, deeply-incised streams (V notches) that are susceptible to rapid sediment and debris transport. Historical evidence of landslides are numerous in the area. According to the unit card, the upper slopes have poorly drained soils and blue clay deposits, making the risk of mass movement high. Steep slopes of 40-65% with some areas exceeding 75% are noted.

In addition to the slope stability concerns within the unit, it appears that a slope break buffer will be retained along the top of the large and deeply incised Class III V-notch.

This forms the western unit boundary and is directly tributary to the Class I habitat of King George Creek. Given the high risk of windthrow within this portion of the King George Creek drainage (page 3-44), a significantly high risk exists that the buffer will blow down into the notch. This may result in slope failure and channel scouring from a debris torrent into King George Creek. We have concerns for the high risk of blowdown and slope failure in the long, narrow island of unharvested timber to be retained in section B of the unit.

Given the inherent slope instability of this area and the high potential for sediment delivery to adjacent King George Creek, we recommend that this unit should be dropped from harvest consideration. However, if it remains in the selected alternative, then we recommend deleting the western portion of the unit (sections A and B), and harvesting the eastern portion (sections D and E) entirely by helicopter to eliminate road segment 5.

Unit 22: This unit contains eight Class III streams that are directly tributary to the Class I fish habitat of King George Creek, located immediately adjacent to the lower unit boundary. Two small islands of unharvested timber are proposed to be retained within the unit, each of which encompass a Class III stream. Depending on the direction and intensity of winds within this area, these islands may be susceptible to blowdown which, depending on its extent, may create a source of sediment delivery to King George Creek through upturned rootwads and destabilized sideslopes and stream banks. The windthrow potential within this unit should be investigated prior to establishing these two islands.

#### Forest Service Standards for Road Closure

We have recently commented in the Shamrock FEIS/ROD and the Port Houghton/Cape Fanshaw DEIS that we are not satisfied with the FS's proposed methods of road closure. We believe that those concerns need to be raised again here. We concur with DEC's comments to this DEIS [ May 24, 1996, page 5] regarding FS standards for road closure.

As described in the DEIS, the proposed methods of road closure for maintenance level 1 specified roads are inconsistent with the standards of **11 AAC 95.320**. Depending on the alternative, various amounts of road closure are proposed following completion of this timber sale. No detailed descriptions are provided to detail what these closures will provide. Due to repeated statements that mention periodic maintenance needed to keep culverts functioning, we are assuming that most drainage structures will be left in-place.

Although periodic maintenance is prescribed for these structures, according to the road cards, all of the roads will be closed by water barring to prevent vehicle passage. Consequently, it is difficult to understand how routine maintenance will be performed when vehicular access to these structures is blocked. As indicated earlier in our discussion of road segments 4 and 8, this presents significant concerns for

crossing structure failure and associated impacts to water quality, especially for those culverts that have been identified as having a high risk for structure stability and maintenance.

The road closure standards of **11 AAC 95.320** are very specific and require the removal of all bridges, culverts and fills, outsloping or water barring the road surface, and leaving ditches in a condition suitable to reduce erosion. To be consistent with the ACMP and to minimize the risk of water quality degradation and downstream fish habitat, these standards must be complied with for all roads designated as closed within the King George project area. If the Forest Service subsequently indicates that these roads will actually be inactive, rather than closed, then the road maintenance standards of **11 AAC 95.315(c)(1-3)** will apply. Specifically, these include: (1) keeping ditches and drainage structures maintained as necessary to assure water flow and fish passage; (2) keeping the road surface crowned, outsloped, water barred, or otherwise left in a condition not conducive to erosion; and (3) keeping ditches and drainage structures clear and in good repair. However, equipment and vehicular access will be required in order to conduct these on-going maintenance activities.

We appreciate the opportunity to comment.

cc:

Lana Shea Flanders, ADF&G  
Kim Titus, ADF&G  
Bob Schroeder, ADF&G  
Kevin Hanley, ADEC \*\*  
Tom Paul, ADF&G \*\*  
Lisa Weissler, DGC \*\*  
Jim McAllister, ADNR  
Abigail Kimbell, USFS  
Meg Mitchell, USFS  
Carol Hale, USFWS  
Petersburg staff, ADF&G \*\*

\*\* - copies sent via e-mail

# MEMORANDUM

State of Alaska

Department of Environmental Conservation

TO: Jennifer Garland  
Project Review Coordinator  
OMB - DGC

DATE: May 24 , 1996

FILE NO: AK9604-26JJ

THRU: Jim Ferguson  
Team Leader, Forestry Services

TELEPHONE NO: 465-5364

FROM: Kevin J. Hanley *KJH*  
Environmental Specialist  
Division of Air and Water Quality

SUBJECT: King George Timber Sale DEIS

The Department of Environmental Conservation has reviewed the Draft Environmental Impact Statement (DEIS) for the U.S. Forest Service's proposed King George Timber Sale on Etolin Island. This sale, which may be offered to both small and large timber operators, proposes to harvest between 14.1 and 26.6 MMBF of timber from approximately 900 to 1300 acres, and to construct between 0 and 12.7 miles of road, depending on alternative. In addition, a drive down log transfer facility (LTF) is proposed in conjunction with the roaded alternatives (2 through 5) at a location along Zimovia Strait, approximately 2600 feet north of Honeymoon Creek. This facility will undergo a separate Alaska Coastal Management Program (ACMP) consistency review, and will be subject to a DEC Certificate of Reasonable Assurance (401 Certification).

The Forest Service has identified Alternative 5 as the preferred alternative for this project. This alternative proposes to harvest approximately 26.6 MMBF of timber from 1,357 acres, and to construct a total of 12.7 miles of specified and temporary road as well as the LTF north of Honeymoon Creek. According to the EIS, this is the maximum harvest alternative and will remove most of the available timber volume during this initial entry. We offer the following comments pursuant to 6 AAC 50 of the ACMP and Section 319 of the Clean Water Act (CWA). These comments collectively address ACMP, CWA Section 319, and NEPA concerns, with ACMP standards cited, where applicable.

Overall, we were pleased to see the range of alternatives that are presented in the DEIS, and the large amount and variety of uneven-aged management prescriptions that are proposed for the vast majority of the units. In addition, the concise format and friendly tone of the document was very much appreciated. We do, however, have concerns regarding the preferred alternative and the Forest Service standards for road closure (maintenance level 1). These concerns are outlined as follows:

## 1. Selection of Alternative 5 as the Preferred Alternative

According to the DEIS, Alternative 5 was selected as the preferred alternative primarily because it has the greatest potential to be divided among large and small operators. However, this alternative also poses the greatest relative risk to water quality within the highly productive and sensitive King George Creek Watershed. For example, according to the DEIS (Tables B-2 & B-1), 79 percent (4.7 miles) of the roads to be constructed, and 36 percent (159 acres) of the units to be harvested within this watershed have been rated as having a high risk of sediment

transport to fish habitat. This level of risk is particularly disproportionate given the high fisheries values of King George Creek, which the EIS describes as being the most productive fish stream in the project area, in terms of species richness and escapements (page 3-42). Specifically, we are most concerned about the following road segments and units:

a.) Road Segments

Segment 4: This segment extends from Honeymoon Pass to King George Creek and has been given a high risk rating for sediment transport to fish habitat. According to the EIS (page 3-30), it *"crosses two deeply notched Class III streams that have the potential to produce enough debris to block culverts and lead to road erosion. The risk and potential consequences (on downstream fish habitat) are high enough that oversize structures and periodic maintenance are needed to reduce the risk. Keeping the road open to these structures may benefit access for maintenance"* (however, this road is proposed to be closed under Alternative 5 with, apparently, the culverts left in place). The road card characterizes one of these crossing sites as *"waterfalls up and downstream of crossing, large debris and bedload transport make this site high risk for structure stability and maintenance" ... "Greater than average risk associated with plugging and failure of V-notch crossing at southern boundary of Unit 17."*

Consequently, if this segment is constructed, it is critical that these structures be removed during road closure (as required by **11 AAC 95.320**) to eliminate the potential for road washout and impacts to downstream water quality within the Class I habitat of King George Creek. If the road is placed in inactive status, or is used periodically over the long-term to provide access for silvicultural or other administrative purposes, then bridges should be installed rather than culverts. This is required to be fully consistent with **11 AAC 95.300(a)(7)**, which states **"in deep V-notches or in drainages where a culvert may require substantial fill, a bridge is the preferred crossing structure, if feasible."**

Segment 5: This segment accesses the eastern portion of Unit 18 directly above and on the north side of King George Creek. According to the road card, the *"Soils are somewhat poorly drained with basal till parent material [blue clay] along this road segment" ... "At the [eastern] unit boundary, the road crosses an old landslide tract" ... "A short section of road has 60%+ slopes where it crosses a small stream. The steep slopes with evidence of past failure indicate that there is a high risk of slope failure. There is a high chance that sediment would go directly into King George Creek if hillslope failure occurs in Unit 18"* (emphasis added).

Given these characteristics, and the high potential for slope failure and direct impacts to the water quality and fish habitat of King George Creek, we believe that this road should not be constructed. Rather, if the Forest Service elects to implement Alternative 5, then Unit 18 should be harvested entirely by helicopter.

Segment 8: This road parallels King George Creek and accesses the middle and lower portions of the watershed. It has been given a high risk rating for sediment transport to fish habitat. According to the EIS (page 3-33), *"This segment crosses several Class III streams that have the potential to produce enough debris to block culverts and lead to possible erosion and road washouts. One large stream crossing is particularly high risk."*

As depicted on the road card map, culvert installations are proposed for at least eight streams that are crossed by the alignment and are directly tributary to the Class I habitat of King George Creek located a short distance downstream. From the road card narrative, it appears that two of these streams are relatively unstable and somewhat substantial in size. According to the Watershed/Fisheries report, the first of these ("Hydro site #1") *"appears to be a debris avalanche/stream depositional area between Units 24 and 25."* The second, located between Units 25 and 26, is described as having *"high risk for structure stability and maintenance. This stream has large debris and bedload transport with a troublesome approach on [the] west side (out of notch)."* The Access Management report states that *"This road segment will be closed under Alternatives 2 and 5 by placing a gate or some other type of closure at the bridge that crosses King George Creek, or by blocking the road near the pass (by unit 15) with large boulders."* As no mention is made of culvert removal, we assume that these "high risk" structures are intended to remain in place following completion of sale activities.

While we would prefer that this road not be constructed, if it is, then it is essential that these crossing structures be removed upon completion of harvest activities. This is also necessary to be consistent with the road closure standards of **11 AAC 95.320**, which require the removal of all drainage structures and their associated fills. However, as with Segment 4, if this road is intended to provide periodic access over the long-term, then bridges should be installed at these crossing sites rather than culverts [**11 AAC 95.300(a)(7)**].

An additional concern for this segment is that, according to the Soils/Geology report, it will cut through *"Deep stratified sand deposits"* in the vicinity of Unit 24, which are inherently unstable and pose a high risk of chronic cutslope failure and blockage of ditchlines. These sand deposits are especially significant given their relatively close proximity to the mainstem of King George Creek, and their association with the apparently unstable "Hydro site #1" stream. Special practices, such as riprapping or ballasting the cutslopes, along with the standard revegetation practice will be required along this segment to minimize sloughing and ditchline blockage. However, as indicated above, we would prefer that this area be avoided altogether by not constructing this road.

b.) Units

Several of the proposed units within the King George Creek watershed present concerns for water quality relative to slope stability and blowdown of reserve trees. We believe this is an ACMP issue relating to **AS 41.17.060(b)(5)** and **(c)(5)** which state, respectively, **"significant adverse effects of soil erosion and mass wasting on water quality and fish habitat shall be prevented or minimized"** [(b)(5)], and **"there may not be significant impairment of the productivity of the land and water with respect to renewable resources"** [(c)(5)]. Specifically, these units include the following:

Unit 17: According to the unit card, *"There is extensive windthrow"* within this unit. Despite this finding, an island of unharvested timber is proposed to be retained within section A of the unit, just north of and in close proximity to the Class III stream at the southern unit boundary. This is the same stream that was identified in the road card narrative for Segment 4 as having large debris and bedload transport concerns. Given its position on the landscape, this island will be highly susceptible to windthrow which, should it occur, could initiate a slide into this Class III tributary, which may result in a debris torrent to King George Creek. Therefore, to better

minimize the risk of blowdown-induced slope failure, this island either should not be retained, or it should be relocated farther north within the unit at a location where a potential slide will be less likely to enter surface waters.

Unit 18: This unit is located on steep slopes directly above and on the north side of King George creek, and has been given a high risk of sediment transport to fish habitat (Table B-1). The EIS (pages 3-44 & 3-45) characterizes this area as having *"steep, deeply-incised streams (V notches)"* that *"are especially efficient at rapidly transporting sediment from unstable sideslopes or during debris flows."* In addition, *"numerous old landslide scars"* are present and are indicative of the inherent slope instability of this area. According to the unit card, the upper slopes of this unit *"have somewhat poorly drained soils underlain by basal till [blue clay]. The risk of mass movement for these soil types is high. Slopes are generally 40-65% with some areas exceeding 75%."*

In addition to the slope stability concerns within the unit, it appears that a slope break buffer will be retained along the top of the *"very large and deep"* Class III V-notch which forms the western unit boundary and is directly tributary to the Class I habitat of King George Creek. Given the reported higher risk of windthrow within this portion of the King George Creek drainage (page 3-44), a significantly high potential exists that this buffer will blow down into the notch, which may result in slope failure and a channel scouring debris torrent to King George Creek. Similar concerns for blowdown and associated potential slope failure exist for the long, narrow island of unharvested timber to be retained in section B of the unit.

Given the inherent slope instability of this area and the high potential for sediment delivery to adjacent King George Creek, we believe this unit should be dropped from harvest consideration. However, if it remains in the selected alternative, then we recommend deleting the western portion of the unit (sections A and B), and harvesting the eastern portion (sections D and E) entirely by helicopter, thereby eliminating the need for road segment 5.

Unit 22: This unit contains eight Class III streams that are directly tributary to the Class I habitat of King George Creek located immediately adjacent to the lower unit boundary. Two small islands of unharvested timber are proposed to be retained within the unit, each of which encompass a Class III stream. Depending on the direction and intensity of winds within this area, these islands may be susceptible to blowdown which, depending on its extent, may create a source of sediment delivery to King George Creek through upturned rootwads and destabilized sideslopes and stream banks. If not already done, the windthrow potential within this unit should be investigated prior to establishing these two islands.

---

In light of the high fisheries values of King George Creek and the concerns discussed above, especially those for the proposed road construction, we highly recommend against implementing Alternative 5 as the selected alternative for this project. According to the EIS, this alternative is the least environmentally preferred of all the alternatives in terms of potential risk to aquatic habitat, primarily because of its entry into the King George Creek watershed. Alternative 4, on the other hand, avoids entering this watershed and poses the least risks to water quality and fish habitat of all the roaded alternatives, while still providing a positive economic return and opportunities for small timber operators. Consequently, we strongly urge the Forest Service to adopt Alternative 4 as the selected alternative for the FEIS/ROD.

## 2. Forest Service Standards for Road Closure

As described in the DEIS, the proposed methods of road closure for maintenance level 1 specified roads are inconsistent with the standards of 11 AAC 95.320. For example, depending on the alternative, various amounts of road closure are proposed following completion of this timber sale, with Alternative 5 proposing post-sale closure of all the roads approximately five years after harvest completion. Although no detailed description is provided as to what this closure will entail, according to the EIS (page 3-28), *"Even if a road is closed, some roads will need to be maintained to some degree in order to keep culverts functioning so that blockages do not occur that would result in washouts and sedimentation problems."* In addition, the EIS indicates that for closed roads, *"Periodic maintenance would still be needed to reduce the risk of drainage structures failing."* Therefore, it is apparent that most, if not all, of the drainage structures on specified roads will be left in place following close-out of sale activities. Although periodic maintenance is prescribed for these structures, according to the road cards, all of the roads will be closed by water barring to prevent vehicle passage. Consequently, it is difficult to understand how routine maintenance will be performed when vehicular access to these structures is blocked. As indicated earlier in our discussion of road segments 4 and 8, this presents significant concerns for crossing structure failure and associated impacts to water quality, especially for those culverts that have been identified as having a high risk for structure stability and maintenance.

The road closure standards of 11 AAC 95.320 are very specific and require the removal of all bridges, culverts and fills, outsloping or water barring the road surface, and leaving ditches in a condition suitable to reduce erosion. To be consistent with the ACMP and to minimize the risk of water quality degradation, these standards must be complied with for all roads designated as closed within the King George project area. If the Forest Service subsequently indicates that these roads will actually be inactive, rather than closed, then the road maintenance standards of 11 AAC 95.315(c)(1-3) will apply. Specifically, these include: (1) keeping ditches and drainage structures maintained as necessary to assure water flow and fish passage; (2) keeping the road surface crowned, outsloped, water barred, or otherwise left in a condition not conducive to erosion; and (3) keeping ditches and drainage structures clear and in good repair. However, equipment and vehicular access will be required in order to conduct these on-going maintenance activities.

We appreciate the opportunity to comment.

cc: Mike Conway, ADEC  
Len Verrelli, ADEC  
Lisa Weissler, DGC  
Lana Shea Flanders, ADF&G  
Phil Mooney, ADF&G  
Jim McAllister, ADNR  
Abigail Kimbell, USFS  
✓Meg Mitchell, USFS  
Randy Coleman, USFS  
Bill Ryan, USEPA



United States  
Department of  
Agriculture

Forest  
Service

Alaska Region Tongass National Forest  
Stikine Area  
P.O. Box 309  
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File Code: 1950

Date: August 1, 1996

Jennifer Garland  
Division of Governmental Coordination  
Central Office  
P.O. Box 110030  
Juneau, AK 99811

Dear Ms. Garland:

Thank you for reviewing and commenting on the King George Timber Sale DEIS. Our response follows the sequence of your comments and addresses the comments we received from ADF&G and DEC.

#### Consistency Finding

I believe that we have been responsive to the suggestions made by the State in its review of the King George Timber Sale EIS. In most cases we made the recommended adjustments or supplied clarifying information. In general, we have addressed road maintenance concerns, dropped several road segments and modified the harvest prescriptions of some alternatives. I therefore determine that Alternative 5 as adjusted and described in the FEIS is consistent with the ACMP, and that no further ACMP review is needed. The adjustments are described in this letter as well as the Record of Decision and Chapter 2 of the FEIS.

#### Roads

The selected alternative uses a variety of road "closure" techniques in the King George Timber Sale area and the FEIS contains additional information (Appendix F) which clarifies the site-specific measures to be employed. We received a lot of public comment on this topic. Developing a reasonable long-term road management strategy was a major focus of ID Team discussion between Draft and Final EIS's. An additional field review of the road system was conducted to evaluate the suitability of drainage structure design options under different road management strategies. The road management strategy selected is consistent with both the Alaska Forest Resources and Practices regulations and the Forest Service BMPs. Some road segments will be obliterated by blocking motorized access, removing drainage structures and restoring natural drainage, consistent with 11 AAC 95.320. Some road segments will be administratively closed to motorized access by installing a gate which would provide for routine road maintenance activities, consistent with 11 AAC 95.315(c).



## Segment 4

The project hydrologist reviewed this road segment and design plans for its drainage structures in the field with the project engineers between the Draft and Final EIS. During this review, they resolved concerns related to debris loads, erosion, and risk to downstream fisheries. The structure design and road management strategy (including routine maintenance) minimize these concerns.

## Segment 5

The ID Team recommended that this road segment be dropped from the final Alternative 5 because they felt the level of risk to downstream fisheries was unacceptable. It has been dropped and Unit 18 will be designated for helicopter harvest only.

## Segment 8

Some modifications in road location between the Draft and Final EIS, as well as design changes agreed to during the above-mentioned field review have alleviated these concerns. Use of temporary log stringer bridges at the last two hydro sites on this road will minimize direct short and long term impacts to water quality and fish habitat. The sand deposits are located downslope of the road and it is possible that they will not be encountered during road construction. The concern is retained in the road card to alert the operator of contingency erosion control measures such as you've described.

## Water Quality and Fish Habitat

The FEIS includes a clarification of the ratings of relative risk to water quality displayed in Appendix B tables. Please note that the risk rating is relative. The ID Team designed Best Management Practices to protect water quality and aquatic productivity in all alternatives. While it is true that each alternative poses a different level of risk, none of the alternatives result in unacceptable risk to water quality or fish habitat. The risk ratings provided a useful means for 1) prioritizing field verification of potential impacts to the freshwater system, 2) focusing site-specific BMP design, 3) displaying potential site-specific impacts for the decision-maker, 4) displaying the relative risks associated with each alternative, and 5) prioritizing BMP implementation monitoring efforts. The ID Team used a fairly conservative approach to designing units and roads in the study area and was able to minimize what might be termed "absolute" risk of impacts to the freshwater system. The study area terrain does not present any unique risks associated with timber harvest planning. The freshwater system values in the study area are not uniquely high relative to many other watersheds in the Tongass National Forest.





This information is clearly presented in the FEIS. As the decision maker, I am fully aware of the level of risk I am accepting in selecting Alternative 5.

#### Unit 17

The island of retained timber mentioned in your comments within the unit consists of brush and small diameter trees with minimal risk of windthrow. This is not in close proximity to the Class III stream. Other islands and exclusions do not pose an unreasonable risk of windthrow or stream sedimentation.

#### Unit 18

The road has been dropped as mentioned above. The prescription has been modified to yard entirely by helicopter, leave more trees, feather the west unit boundary by removing the large windthrow-prone trees and retaining smaller diameter trees wherever possible. The retention areas within the unit contain smaller diameter trees and are predicted to be as windfirm as possible.

#### Unit 22

Large trees within the retention areas will be removed, leaving more windfirm, smaller diameter trees in these areas.

#### Fish Stream Crossings

The road cards in the FEIS describe major stream crossings in more detail.

#### Wildlife Habitat

I disagree that Unit 28 blocks the travel corridor between the King George and the Red Mountain old growth block. A 500 foot beach buffer connects the two large blocks and the majority of the harvest is group selection. Areas designated to be harvested with 30% and 50% green tree retention are dispersed, thus allowing for wildlife travel between them.

Although I understand ADF&G's concern regarding windthrow and the relative wildlife value of 30% green tree retention prescriptions, making smaller clearcuts would just delay the harvest, not retain the trees indefinitely. Maintaining 30% of the trees in the unit will promote a large tree component in the future stand which will be important to many species. In the short term, you make a good point. Thirty percent retention will essentially equal a clearcut to some species, which is why the ID Team modeled the units as clearcuts for management indicator species analysis. Since these alternative harvest methods are fairly new, there are not many studies to cite, but the FEIS does cite a study by Doerr (1995). The FEIS also notes that hairy woodpeckers were recently found nesting in a partial harvest unit in the Campbell Timber Sale.



## Honeymoon Stand

Several comments (including ADF&G's) have expressed concerns about the 'honeymoon volume class 7 stand.' In the FEIS we have modified the harvest prescription to use uneven-aged harvest methods to harvest only the portion of the stand below the road. This harvest prescription will help to further reduce fragmentation concerns and perpetuate the intermittent patches of large trees existing in the stand. Another Volume Class 7 stand is located within a designated old-growth retention area. I did not select the option of locating the road on the south side of Honeymoon Creek for several reasons: 1) to manage the area on the north side, a system of temporary roads would need to be constructed on the north side. This would end up establishing a road system on both sides of the Creek over time; 2) the cost of the road on the south side reduces the economic viability of Alternative 2; 3) there would be increased effects on wetlands.

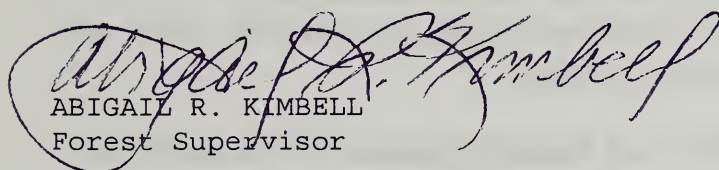
## Proportionality

Table 2-6 has been expanded in the FEIS to describe the amount of harvest in each volume class. At this time, we plan on offering the main sale and subsequent small sales as small business set-aside sales under the independent sale program. Such sales are not subject to proportionality requirements. However, we do understand your concern and have described in the FEIS that Alternative 5 changes the proportion of Volume Class 6 and 7 by 1.2%.

## Recommended Preferred Alternative

I considered Alternative 4, along with all of the other alternatives and their relative risks, in making my decision. Alternative 4 is responsive to freshwater system and habitat conservation values. I direct your attention to the Record of Decision which discusses my rationale for selecting Alternative 5.

Sincerely,

  
ABIGAIL R. KIMBELL  
Forest Supervisor





# United States Department of the Interior

OFFICE OF THE SECRETARY  
Office of Environmental Policy and Compliance  
1689 C Street, Room 119  
Anchorage, Alaska 99501-5126

ER 96/268

Ms. Meg Mitchell  
U.S. Forest Service  
Wrangell Ranger District  
Tongass National Forest  
P.O. Box 51  
Wrangell, Alaska 99929

JUN 10 1996

Dear Ms. Mitchell:

In response to your April 4, 1996, request, we have reviewed the King George Timber Sale Draft Environmental Impact Statement (EIS). We offer the following comments (see Enclosure #1) for your consideration.

We remain concerned about the cumulative effects of this project in combination with other ongoing and proposed U.S. Forest Service (USFS) and private timber harvests across the Tongass National Forest (Tongass), particularly in relation to long-term species' viability.

Several timber sale proposals, including the King George Timber Sale, are at various stages in the National Environmental Policy Act (NEPA) process. Collectively, these sales are expected to have adverse effects on habitat for the Queen Charlotte goshawk (*Accipiter gentilis laingi*), Alexander Archipelago wolf (*Canis lupus ligoni*), and other habitat-limited species by removing habitat and fragmenting large old-growth blocks, which are critical for maintaining viable, well-distributed populations of wildlife across the forest landscape.

The U.S. Fish and Wildlife Service (FWS), USFS, and Alaska Department of Fish and Game (ADFG) are cooperating in the preparation of conservation assessments for the Queen Charlotte goshawk, Alexander Archipelago wolf, and marbled murrelet (*Brachyramphus marmoratus*) in accordance with the December 1994 Interagency Memorandum of Understanding. The long-term land management requirements of these and other old-growth dependent species are also being addressed through revision of the Tongass Land Management Plan (TLMP). Given the ongoing, cooperative interagency efforts to gather more information on goshawks and wolves, as well as their habitat requirements throughout the Tongass, we believe the Final EIS should state how the proposed timber sale would support those efforts.

In recent decisions the FWS determined that listings of the Queen Charlotte goshawk and Alexander Archipelago wolf for protection under the Endangered Species Act were not warranted. In part, those decisions were based on expectations of the USFS employing species-

specific protection strategies into the revised TLMP. During this interim period before the revision of TLMP is completed, USFS NEPA documents continue to contain old information and guidelines that would have minimal effectiveness in protecting species.

We suggest that cumulative impact analyses be conducted for goshawks and wolves, using more recent biological information. We believe these cumulative analyses should be available prior to identification of a selected alternative for this sale. We suggest these assessments be conducted at the landscape level to address losses of habitats throughout Etolin Island. We further suggest that subsequent NEPA documents for the King George Timber Sale and other sales should address these cumulative effects on goshawks and wolves and their habitats.

Enclosed are our General and Specific comments for use in preparing the Final EIS.

We appreciate the opportunity to provide comments for the King George Timber Sale Draft EIS. For your convenience, we have also enclosed copies of referenced letters (enclosures). If you have questions, please contact Carol Hale of the Fish and Wildlife Service at (907) 586-7240.

Sincerely,

A handwritten signature in black ink, appearing to read "Carol Hale", with a long horizontal flourish extending to the right.

Regional Environmental Officer - Alaska

Enclosures (4)

# Enclosure #1

## GENERAL COMMENTS

### **SPECIES OF CONCERN**

The FWS no longer maintains lists of species being considered for listing, such as those formerly designated Category 2 candidate or Species of Concern. Candidate species are now defined as those species for which the FWS has sufficient information on biological vulnerability and threats to support proposals for listing as threatened or endangered. No species meeting the current, revised definition of Candidate occur in Alaska. The FWS encourages agencies to consider species whose status may be at risk, such as the Queen Charlotte goshawk or Alexander Archipelago wolf, when developing and implementing management plans so that their status is not significantly adversely affected.

#### **Queen Charlotte Goshawk**

Recent analysis by the FWS found that listing the Queen Charlotte goshawk as endangered pursuant to the Endangered Species Act was "not warranted" based in part upon insufficient scientific and commercial information. The on-going interagency conservation efforts to assure goshawk population viability across the Tongass were also considered important in the FWS decision. However, USFS management practices and project planning in response to the goshawk population viability concerns have not changed appreciably. The Draft EIS states that the USFS 1992 Interim Habitat Management Recommendations for the northern goshawk would be used during this project. It further states on Page 72, paragraph 1., that if these guidelines are implemented "...it is not likely that any of the proposed alternatives would affect goshawk population viability or tend to make the species more likely to be listed as Threatened or Endangered." This statement may be correct when considering just this project; however, we are concerned that goshawk habitat may be adversely affected by using the 1992 guidelines. We have advised the USFS that these guidelines are inadequate and need to be updated, considering best current available information (see Enclosures 2 and 3).

The Interim Southeast Alaska Habitat Management Recommendations would not mitigate the cumulative effects this and other timber harvests throughout the Tongass would have on goshawk habitat. A substantial amount of information is now available on goshawks in southeast Alaska; we believe this newest information should be used for effects analysis when developing management plans. We remain concerned about the status of the Queen Charlotte goshawk in southeast Alaska, and encourage the USFS to adopt conservative interim guidelines that would avoid compromising the available habitat base by retaining existing large blocks of mature forest needed to assure a viable goshawk population across the Tongass until the Revised TLMP is implemented.

## **Marbled Murrelet**

According to the information in the Draft EIS, the King George area appears to be a breeding and foraging area for marbled murrelets (Chapter 3, page 72). The proposed timber harvest may have significant impacts on this species in the King George area. Research conducted in the murrelet's Pacific Northwest range suggests that there are sufficient indicators to demonstrate a cause and effect relationship between loss of mature forest and a reduction of murrelet populations. As the forest is fragmented further, more forest edge is created, increasing the probability of nest predation (Nelson and Hamer 1995). It has been determined that murrelet populations do not decline immediately after adverse impacts to nesting habitat because of the high adult survivorship and the low reproduction rate of this species (Piatt and Nasland 1995). Population numbers may not reflect effects of such habitat loss for years. We suggest that the Final EIS include a monitoring plan that identifies threshold levels and management measures that would be taken if the population of murrelets drops significantly below current numbers. Also, we suggest the Final EIS analyze how cumulative and secondary impacts of timber harvests would affect this species.

## **Alexander Archipelago Wolf**

The FWS 12 month "not warranted" finding for the Alexander Archipelago wolf was published in the Federal Register on February 23, 1995, pursuant to the Endangered Species Act. However, the FWS remains concerned about the direct and indirect adverse impacts of timber harvest on wolf populations occurring across the Tongass. We believe these impacts may be exacerbated by additional road construction and subsequent use by humans.

Between 5.3 and 12.7 miles of roads are proposed to be constructed for this project. However, the Draft EIS does not present a complete analysis of impacts to the wolf population due to this action, and increased hunting pressure resulting from additional roads. The interagency Viable Population Committee's, 1993 draft strategy, A Proposed Strategy for Maintaining Well-Distributed, Viable Populations of Wildlife Associated with Old-Growth Forests in Southeast Alaska (VPOP), recommended that shoreline access also be taken into consideration when conducting impact analyses. We believe the Final EIS should contain an analysis of the direct, indirect, and cumulative impacts the proposed roads and shoreline access would have on the continued viability of wolf populations.

Whether considered as a separate action or cumulatively within the Tongass, we believe the King George timber sale will have long-term impacts on wolves and their primary prey, Sitka black-tailed deer. The FWS estimates that within the next 10 to 30 years, given historic and on-going old-growth timber harvest on Federal, State, and Native corporation lands, localized reductions in the Alexander Archipelago wolf populations will occur. Wolf populations are expected to decline along with Sitka black-tailed deer populations as clear-cut areas advance into intermediate seral stages.

## **OTHER TRUST RESOURCES**

### **Waterfowl**

The Freshwater Systems and Estuaries section in the Draft EIS identifies habitat types that are important to waterfowl. In a December 2, 1993, response letter pertaining to the Scoping document for the King George Timber Sale, the FWS suggested that waterfowl and shorebird surveys be conducted seasonally in the sale area in order to avoid important areas used by these species for resting and feeding during migration and breeding. We did not find a statement in the Draft EIS to confirm that these surveys were conducted. These surveys would provide essential baseline data on waterfowl use in this area, and could be used to avoid high value habitat areas during helicopter yarding. We suggest the Final EIS explain how important waterfowl and shorebird use areas would be protected during timber harvest activities.

### **Neotropical Migrant and Resident Birds**

We are responsible for certain trust resources, including migratory and resident bird species, such as the Pacific-slope flycatcher, Townsend's warbler, hairy woodpecker, and brown creeper (the latter two are USFS Management Indicator Species). The Port Houghton/Cape Fanshaw Timber Sale Draft EIS (USDA 1995, page 4-34) states that old-growth is ranked as the most important breeding habitat for 41 bird species, and that reduction of this habitat would result in loss and fragmentation of significant habitat for them. We believe the Final EIS should more thoroughly address direct and cumulative impacts the proposed project would have on these and other Federal trust species potentially affected by the loss of mature, old-growth forest and/or forested wetlands.

The Draft EIS (Chapter 3, Page 55, last paragraph and Page 78, Table 3-29) shows hairy woodpecker and brown creeper habitat capabilities would decline as a result of this and future timber sales. The action alternatives propose to reduce the mean size of existing old growth blocks by a range of 79 percent (Preferred Alternative) to 42 percent (Alternatives 3 and 4). We believe such fragmentation may reduce local populations of old-growth dependent Neotropical bird species due to an increase of predation, competition, hatching failure, loss from inclement weather (Chasko and Gates 1982), and noise disturbance (Ferris 1979). Forest edge-effect predation can extend as far as 50 to 600 meters into the forest, requiring forest tracts to be greater than 247 acres in size before forest-interior features are found (Chasko and Gates 1982, Wilcove et al. 1986, and Yahner and Scott 1988). Chasko and Gates (1982) found that songbird nest success rates were lower in nests less than 45 meters from the forest edge than in nests further in the forest due to predation. [Corvids, such as crows, ravens and jays, are edge species that are known forest predators.]

Theoretically, as more forest is cut and roads built, more old-growth edges would be developed that are exposed to wind, snow accumulation, and radiant energy, thus changing the forest micro environment (flora and fauna) that interior forest dependent species (*e.g.*, brown creeper) require

(Wilcove 1987). Table 3-26 shows brown creepers utilizing patch sizes as small as 15 acres, but a patch that small is all edge (S. Kim Nelson, 1993 Letter to Larry Edwards, Enclosure 3). Old-growth forest stands provide important winter habitat features, such as large dominant trees, dense tree canopy, multilayered canopy, and snags, for such species as golden-crowned kinglets and brown creepers. They provide thermal protection from wind and precipitation (Della Sala *et al.* 1994) that forest edges do not. Della Sala (*Id.*) observed particularly low numbers of golden-crowned kinglets in young-growth following storms that coated tree branches with ice and snow, preventing them from foraging for insects.

Studies have shown that roads and trails less than 10 meters wide adversely impact nesting bird communities in forested areas (Askins 1994). The USFS has built an extensive road system into large tracts of old-growth forest blocks throughout the Tongass in order to harvest and transport logs to transfer facilities. We suggest the USFS analyze the adverse impacts that the immense existing and planned road system (permanent and temporary) has on forest fragmentation and the old-growth dependent breeding bird populations.

We suggest the Final EIS include assessments that address Neotropical bird habitat capability on a landscape level, and identify areas that produce large, low elevation cone crops important for red crossbills for inclusion in retention areas.

## **WETLANDS**

Degradation of wetlands caused by heavy equipment impacting vegetation, impairment of natural drainage patterns, loss of nesting and foraging habitat for migratory birds and small mammals, and subsequent displacement or mortality of game species, including Sitka black-tailed deer, black bear, and wolf are of concern. Habitat alteration can result in permanent hydrologic change, and, in some cases, loss of functional wetlands. We suggest the Final EIS address the project's cumulative impact on wetlands, and how the goals of Executive Order 11990, as amended, would be met to avoid to the extent possible the long-term and short-term adverse impacts on wetlands.

During road construction some excavation of wetland overburden is required. We suggest the total cubic yards removed and procedures for material disposal be described in the Final EIS and that the direct and cumulative impacts associated with disposal of this material be more fully discussed in the Final EIS.

We believe the USFS should identify in the Final EIS, the appropriate mitigation to offset unavoidable adverse impacts, which remain after all minimization efforts have been met. We believe restoration that returns biological function and habitat values to impacted areas, such as returning wetlands to pre-existing condition by removing old road beds and preservation of significant habitats, should be discussed in the Final EIS.

## **ROADS**

The Draft EIS (Chapter 3, Page 28-34) recommends closure of several temporary or short-term roads to mitigate adverse impacts to wildlife. We are concerned about the effectiveness of road closure measures. The FWS has observed that implementation of road closures, as proposed, has not eliminated or controlled access to affected fish and wildlife habitat areas. We believe post-timber operation road closures as mitigation for adverse impacts on wildlife populations is of minimal benefit to fish and wildlife if closures are neither effective nor enforced. The Draft EIS (Page 30 and Appendix B, Road Segment 4 card) states that the road Segment No. 4 in Value Comparison Unit 462 south of harvest Unit 17 is located in an important wildlife travel corridor "pinch point." The road would also cross a Class I stream in an area of "high risk for structure stability and maintenance." We suggest that in the Final EIS, this road section be eliminated, and a new alternative, similar to the Preferred Alternative, be considered, with harvest Units 20 through 25 harvested by helicopter.

We suggest the USFS conduct an analysis, and discuss the results in the Final EIS, for utilizing more helicopter yarding as an alternative harvest method to reduce the need for additional roads, thus reducing impacts to fish and wildlife, as well as possibly saving money over the long-term by reducing construction, repair, and maintenance costs.

## **MONITORING, ENFORCEMENT AND REHABILITATION PROGRAMS**

We suggest in the Final EIS, the Best Management Practices monitoring plan describe monitoring frequency, priority, and corrective measures. All monitoring, enforcement and rehabilitation programs require a commitment of personnel and budget. To ensure that such programs are maintained at a functional level, the Final EIS should, we believe, identify how funds would be committed and maintained throughout the life of the project.

## **WILDLIFE MODELS**

We suggest the Final EIS state which wildlife models were used, except for the deer model, none were identified in the Draft EIS. If the Draft EIS used the habitat capability models produced by Suring et al. 1992, Suring et al. 1988, and Suring and DeGayner 1988, on which to base habitat capability and patch size effectiveness conclusions, then we believe the information for the Final EIS should be updated, since these models are outdated, overly simplistic, and are not useful in determining population viability (Kiestler and Eckhardt 1994). New, more empirical information is available and, we suggest, it be used for the wildlife effects analysis used for the Final EIS. The VPOP draft strategy; the ADFG September 1995 final goshawk report, Goshawk Habitat Relationships on the Tongass National Forest; the FWS 12-month finding on the goshawk and the Alexander Archipelago wolf; and the 1996 interagency draft wildlife assessments all have more recent information on species that have large home ranges that can be used for the project wildlife effects analyses.

## **FIELD INVENTORIES**

The Draft EIS states that wildlife field surveys were conducted in the project area. However, it does not indicate the types of survey methodologies employed, the percentage of units covered, the frequency, or time of year that such surveys were performed. We believe survey information should be in sufficient detail to allow a meaningful evaluation of the impact of the proposed project on those species that may utilize the area. We suggest that the reports, even if summarized in the Appendices, be included in the Final EIS. We suggest the sampling methodologies and any variations therefrom should be described; including sampling dates, times, and any other factors that may influence sampling results. Furthermore, we suggest a map be provided that identifies the location of all pedestrian transects, trap grids, herpetology arrays, or other sampling plots used to determine the on-site status of species.

## **SPECIFIC COMMENTS**

### **CHAPTER 3:**

**Page 26.** The Draft EIS does not give the total current acreage of each forest volume class in the project area. We suggest Volume Class 7 stands be harvested with the other classes proportionately, as all classes currently exist. Furthermore, this information may be important if this sale is offered to Ketchikan Pulp Corporation for compliance with the proportionality rule in the Tongass Timber Reform Act, 1990. We suggest the Final EIS plainly show how many acres are in each volume class in the project area and how many acres of each class would be cut.

**Page 35, Freshwater Systems and Estuaries.** We suggest the maps in this section in the Final EIS include the names of the streams.

**Page 53, Fragmentation, first paragraph.** The citation "Suring et al 1993" is not listed in the Literature Cited list; the older (1992) version of this document is listed instead. We suggest using the 1993 version of this document. Please note that the 1992 version was an earlier draft with errors.

**Page 55, Table 3-26.** We believe this table is misleading and should be corrected in the Final EIS.

The minimum old-growth forest patch sizes for optimum habitat listed and used to determine habitat capability for this project area, are not large enough to maintain viable wildlife populations, particularly the marten. The table infers that the old-growth patch sizes in the second column are large enough to contain the home ranges of the wildlife species listed in the first column. Male marten home ranges have been found to be as large as 4,718.46 acres, with a median size of 1,358.7 acres (Flynn 1994). This is 26 times larger than the 180 acres listed as utilized by martens in the table. Martens may be found in patches of 180 acres, but that does not mean that they provide year-round marten habitat requirements.

The 1996 draft Conservation Assessment for the Northern Goshawk in Southeast Alaska (Iverson et al. in prep.) shows a mean 100 percent minimum convex polygon use area of 12,196 acres for goshawks in Southeast Alaska, with a range in size from 1,072 to 59,549 acres. This disparity of use area size has such a large variance that statistical characterization of a typical use area may not be appropriate in this context. The 5,000 acres listed for goshawks in the table may accommodate some birds, but home range sizes likely depend on habitat conditions, and are not uniform in size.

The patch sizes listed for some of the other bird species, such as the brown creeper, are too small when considering edge effects. In their, 1993, draft Strategy, the VPOP recommended 40,000 acres for large Habitat Conservation Areas (HCA), 10,000 acres for medium HCAs, and 1,600 acres for small HCAs in order to maintain viable old-growth dependent species populations. The VPOP Strategy peer review, Review of Wildlife Management and Conservation Biology on the Tongass National Forest: A Synthesis with Recommendations, and the December 1995, Marten Viability Assessment Panel found that even the VPOP recommendations were only minimally acceptable to maintain viable populations. If the VPOP HCAs are not large enough to maintain viable wildlife populations, then neither are the patch sizes in Table 3-26. We suggest that the HCA sizes in the VPOP Strategy, with the peer review suggested modifications, be used for the habitat capability analysis in the Final EIS.

We believe the project area habitat capabilities are expected to be lower using this updated information; therefore, the conclusions in the "Effects on Management Indicator Species" section starting on page 3-75 are flawed and should be updated for the Final EIS. Table 3-26 is erroneous and does not adequately allow for the needs of wildlife species. We suggest dropping it for the Final EIS.

**Page 56, Old Growth Block Maps.** These maps are illegible. We suggest including larger maps in the Final EIS, with a clearer differentiation between old-growth types. We also suggest including the numbers of acres of the interior patches in the project area, preferably in chart form.

**Page 60, Habitat Conservation Areas.** The Draft EIS states that "the team has followed Stikine Area direction to design areas of old-growth retention to maintain the viability of all old-growth dependent species following recommendations in VPOP." It states that the team suggested that some of the habitat retention requirements should be met in two blocks, one in the Lower King George Land Unit and the other in the Red Mountain Land Unit. However, it does not appear that the Red Mountain Land Unit meets the VPOP size criteria. In fact, the Preferred Alternative proposes to harvest 140 acres in harvest Unit 28 to decrease the size of the forested area even further. We suggest that retention areas identified in the Final EIS meet the VPOP criteria as closely as possible and that Unit 28 be deferred from harvest.

**Page 61.** The Draft EIS states that the Red Mountain retention block provides a link between old-growth blocks in the planning area and old-growth blocks to the south. However, on page 62, it states that harvest Unit 28 may separate the retention block from other old-growth blocks in

the study area. Unit 26, with a two-aged management prescription, also appears to separate the Red Mountain retention block from other old-growth blocks in the study area. Though the harvest prescription for Unit 28 is uneven-aged management, we suggest that in the Final EIS, this unit be eliminated from consideration for harvest.

**Page 71, Northern Goshawk, first paragraph.** We believe the most recent information should be used in the Final EIS to determine the wildlife impacts of this project. The VPOP 1993 Strategy; the ADFG September 1995 final report, Goshawk Habitat Relationships on the Tongass National Forest; the FWS 12-month finding on the goshawk; and the April 1996, draft Conservation Assessment, all have more recent information on northern goshawks in Southeast Alaska that can be used for the project effects analysis.

We believe the Final EIS should include a citation that clarifies the statement: "However, these productive forest areas need not be large and a mosaic of habitat types may be more important."

The Draft EIS states that edge habitats may not be avoided by goshawks. The ADFG 1995 final report, Goshawk Habitat Relationships on the Tongass National Forest, stated that goshawks selected productive old-growth (POG) stands. There was no difference between goshawk uses of POG interior habitat or POG edge, except between POG and POG edge at clearcuts. We suggest this be clarified in the Final EIS.

**Page 72.** The definition for Category 2 species in the Draft EIS, "persuasive data on biological vulnerability ... are not currently available to support proposed rules," is basically correct; however, the FWS no longer maintains a Category 2 species list. This should not be construed to mean that we are not concerned about species, such as the wolf and the goshawk, whose old growth habitats continue to be lost at unacceptable rates due to this and the many other timber sales throughout the Tongass.

**Page 78, Honeymoon Stand (and Appendix A, Page 16).** The Draft EIS states that the Volume Class 7 timber stand in the Honeymoon Creek watershed is the only upslope stand of that class not in a riparian area. Considering how rare Volume Class 7 is in Southeast Alaska, we agree with the proposal on page 20 in Chapter 2 to defer harvest of Units 6, 10, 11, and 12. We suggest the Final EIS be expanded to discuss deferring harvest in this stand and locating any necessary road where it would minimize fragmentation.

**Index.** Some of the page numbers in the Index are incorrect. The Index needs to be reviewed and corrected.

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United States  
Department of  
Agriculture

Forest  
Service

Alaska Region Tongass National Forest  
Stikine Area  
P.O. Box 309  
Petersburg, AK 99833

File Code: 1950

Date: August 1, 1996

Paul Gates  
U.S. Department of the Interior  
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Office of Environmental Policy and Compliance  
1689 C Street, Room 119  
Anchorage, Alaska 99501-5126

Dear Mr. Gates:

Thank you for your comments on the King George Timber Sale Draft EIS. The detail provided in your comments is helpful and allows us to improve those parts of the documents that did not come across clearly. Your comments were given serious consideration in the final decision for the King George Timber Sale. While we appreciate the additional information you provided, some of your comments seemed to miss the point we were trying to make, so I am providing the following responses to your comments to clarify the reasoning behind our analysis.

Page 1 of your comments goes into detail about why the interim guidelines aren't sufficient to maintain viable goshawk populations and how we should retain existing large blocks of mature forest. This ignores the discussions we included about the old growth reserve (HCA) strategy and the patch size availability elsewhere in the document and in Appendix A. We disclose that there will be effects on goshawks and their habitat, but with the combination of the interim guidelines and reserves, the possibility for viable populations is maintained, according to VPOP.

The only indication that goshawk viability may not be retained is the patch size table (which your comments suggest we drop). The fact that there won't be a block of interior old growth > 5000 acres left after any harvest alternative, does indicate that there could be a goshawk viability concern. We have edited page 3-72 to add the old growth reserve strategy to the discussion about interim guidelines maintaining viability and note that patch size is a concern.

Page 2 - Marbled Murrelet

We have disclosed that the number of acres of murrelet habitat will be reduced, but we also show that there will be many acres in suitable sized patches remaining, as well as suitable nest trees maintained in some of the partial cut stands. Although timber harvesting will reduce habitat availability, we have no method of showing that it will or won't maintain viability. Again, the old growth reserve strategy was developed by the VPOP committee to help maintain viability for a variety of species over a large landscape. Since the reserves are to be permanent, they should maintain species viability even given foreseeable cumulative effects.

G - 67

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#### Page 2 - Alexander Archipelago Wolf

Unfortunately, the wolf habitat capability model used by the Forest Service does not include the effects of roads. A model that did include road effects would basically tell us what is already in the report - how the alternatives rate in terms of effects on wolves. We based that discussion on the road issue. We could lengthen the discussion on the issue, but we won't be able to come up with a solid percentage change. We did disclose that harvest and roads will affect wolves, which is what your comments requested. We added page numbers to our note on the effects on the prey base (deer), so the information can be more easily found. The analysis of the effect on deer indicate that there will be approximately an 8% decrease in the deer habitat capability.

#### Page 3 - Waterfowl

Logistical constraints did not allow us to conduct all of the surveys that we would have liked to have for this analysis. We concentrated our efforts on goshawk, murrelet and large mammal surveys and relied on serendipitous observations and reports from various field crews to determine if there were any notable important waterfowl concentrations in the area. Canada geese were commonly seen in the muskegs along the proposed road corridor in the Honeymoon drainage. Sandhill cranes were seen in the upper King George muskegs. The King George Bay area was determined to be the highest value habitat area for waterfowl and shorebirds. Timber harvest, road construction and helicopter logging activities were planned to avoid impacts to that area.

No important breeding or molting areas were noted, and the wetlands that will be affected by roads do not appear to be of significant importance to large numbers of waterfowl. As we mentioned in the DEIS, we are assuming that the TTRA and beach/estuary buffers will be adequate to protect waterfowl and shorebird habitat.

#### Pages 3 & 4 - Neotropical Migrant and Resident Birds


We have more complete discussions on Management Indicator Species (MIS) birds in the specialist report, but the effects were not major decreases. Table 3-29 shows the effects on hairy woodpeckers and brown creepers, but not flycatchers or Townsend's warblers. The idea of MIS is that those species will represent the habitat needs for a variety of species, which is why we have selected several MIS that use a variety of habitats. The analysis gives a relative comparison of the different alternatives, not necessarily an absolute in terms of "on the ground" habitat capability. Again, the old growth reserve strategy is how we intend to maintain viability.

The suggestion that we look at birds on a landscape level is valid, but the sale area is a fairly large landscape. We have responded to your concerns in the final EIS by adding information on the expected cumulative effects on MIS birds in the WAA from the TLMP 1991 EIS, which may change depending on the final selection in the revision, but it is an indication of some of the foreseeable future effects.

#### Page 4 - Wetlands

The preferred alternative was chosen in part to meet the goals of Executive Order 11990, as described in the Record of Decision. Two road locations were considered in the Honeymoon drainage. The road with the least amount of





construction across wetlands was selected as the preferred route. Application of BMP 12.5 (which states that road construction across wetlands will occur only when there is no practicable alternative) incorporates the goals of Executive Order 11990.

All roads in the King George project area will be constructed for the purpose of timber management using State approved BMP's, and as such, are exempt from permitting under Section 404 of the Clean Water Act. BMP's for road construction across wetlands require that natural drainage patterns be maintained. Ditches, which collect and divert water, and culverts are constructed so as not to interrupt the natural drainage pattern or change the hydrologic conditions beyond the road prism. Excavation of "wetland overburden" is not a standard practice. Therefore, we have not discussed direct and cumulative impacts associated with this practice.

Timber harvest and road construction were planned to avoid impacting the most important wetlands--those in the vicinity of the King George estuary. Wetland habitat will be reduced due to the direct effects of road construction, but these wetlands are the common sphagnum dominated peatlands found throughout the project area. The extent of indirect habitat loss due to logging traffic and helicopter logging can not be assessed; it is possible that some habitat adjacent to roads will be affected by activities in the area. No loss of wetland habitat is expected to occur as a result of "permanent hydrologic change or loss of functional wetlands.

Removing old road beds and returning wetlands to pre-existing condition will be considered for some spur roads in the upper Honeymoon drainage, as noted on the road cards. If feasible, shot rock will be removed, allowing wetland vegetation to recolonize the site.

#### Page 5 - Roads

We understand your concerns about the effectiveness of road closures. While we are concerned that some illegal use may occur on closed roads in the King George area, we believe that the variety of methods prescribed for closing roads after the sale will be effective in making unauthorized use of closed roads by motorized vehicles a rare exception. Use of the roads for maintaining drainage structures will occur on many segments, but that use will be infrequent.

Developing an entirely new alternative at this time is not practical, and it was determined that commercial forest land cannot be fully accessed economically by helicopter yarding without the construction of road segment 4. In response to your comments and those from the State DEC, I have decided to restrict motorized access on road segment 4 by means of a gate at the first drainage structure and we will maintain the segment at level 2. This assures equipment will be able to access the road for maintenance to reduce the risk of drainage structure failure.

#### Page 5 - Monitoring

The Record of Decision for the King George Timber Sale describes our monitoring commitments. While funding and follow up on monitoring efforts after timber sales have closed has been a problem in the past, we have limited our



commitments for this sale, so we should be able to do a more thorough job of implementing the monitoring requirements. Such implementation is, as you know, contingent on funding and time constraints.

Page 5 - Wildlife Models

We edited the EIS to clarify that the models we used are indeed the habitat capability models produced by Suring et al. Although the models are somewhat simplistic, they are what we have currently available and approved. The models were used to determine the habitat capability comparisons in Table 3-29, but the models do not use patch size information, nor do they determine population viability. Your suggestions to determine viability based on VPOP seem to neglect the fact that we are using an old growth reserve strategy, as is recommended by VPOP.

Page 6 - Field Inventories

Including all of our resource inventory and survey plans, routes protocols and data would have made for an unnecessarily large EIS. We have included maps of the areas surveyed for goshawks and murrelets as an appendix to the wildlife specialist report, which can be sent to you if you would like a copy. We did not survey all of the potential harvest units for goshawk or murrelet nesting activity. The units that were surveyed for goshawks are listed on page 3-71 of the DEIS.

Page 6 - Proportionality

We will show the number of acres harvested in each volume class in the final EIS. Proportionality is required only for long-term sales. King George is currently scheduled for the independent sale program. If that should change in the future, a proportionality analysis will be conducted and, if necessary, adjustments will be made to assure the sale is in conformance with TTRA.

Page 6 - Freshwater Systems and Estuaries

Good Idea. We will add stream names to the maps.

Page 6 - Comment on the Suring citation.

Thank you for informing us of this typographical error. We have changed the date to 1993 in the final EIS.

Page 6 - Comment on Table 3-26

Patch size effectiveness is not synonymous with home range. Typically wildlife home ranges include a variety of habitat, some of which is used heavily, while other areas within the home range may be used little or not at all. The home range sizes that you cited do not necessarily have to be 100% old growth or one solid patch. The discussion of patch sizes was meant to show that there will be patches of suitable interior old growth available to support fragmentation sensitive species within their home ranges (which will be larger than the patches). Your comments pointed out the reason that determining population numbers is difficult - the sizes of home ranges can vary greatly for a given species. Therefore, we based our analysis on the availability of suitable habitat in sufficient sized patches, as well as the old growth reserves recommended by VPOP. The acreages given for patches and old growth blocks are interior acres, based on a 300' buffer (page 3-54 of the DEIS).



## Page 7 - Old Growth Block Maps

We will improve the old growth block maps, which as we have explained, show interior old growth with a 300 foot buffer.

## Page 7 - HCA

While old growth reserves are an important part of our desired condition for the landscape, HCA's do not equate to Habitat Capability. HCA's are intended to maintain population viability, while Habitat Capability describes the condition of the habitat throughout the area for a given species.

Patch size is not a criteria for Habitat Capability models either, so your suggestion that the whole analysis is flawed is not valid based on that point (although our models may be flawed for other reasons). If we did follow your suggestion of using only the VPOP strategy for habitat capability analysis in the FEIS, we could eliminate several sections of the analysis and rely solely on the reserves that are already described. That level of analysis does not seem adequate to our staff and we doubt if ADF&G would consider it adequate.

## Page 7 - comment on Page 60 - Red Mountain Reserve

According to VPOP, only 800 acres of the 1600 acres for a small reserve needs to be old growth, so the Red Mountain reserve exceeds the minimum requirement for old growth for a small reserve. Since the King George VCU is relatively large, the inclusion of 2 small reserves is warranted, which we have done at Red Mountain and Lower King George.

## Page 7 - Comment on Page 61

Your comment on the effect of unit 28 on wildlife dispersal from the King George watershed to the Red Mountain small old growth reserve was considered in the decision for the selected alternative; however, we are planning to harvest the unit as proposed in the hope that the high amount of old growth retained by the group selection prescription will allow most, if not all, species of wildlife to disperse throughout the unit.

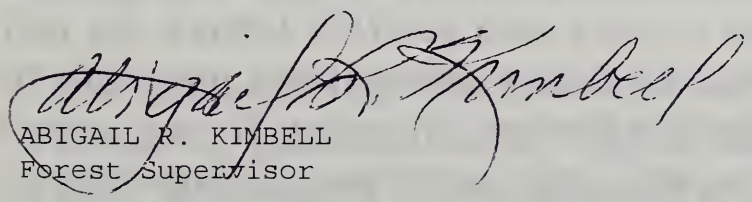
## Page 8 - Comment on Page 71

As you suggested, we edited the goshawk section for the final EIS using information from the ADF&G goshawk study. While we do not have all of the documents that you cited, we feel that for the reasons cited above and in the DEIS, the goshawk analysis is sufficient for this timber sale.

## Page 8 - comment on page 72

Thank you for updating us about the designation of Category 2 species. We have edited the final EIS to reflect your comments.

Sincerely,

  
ABIGAIL R. KIMBELL  
Forest Supervisor



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Wrangell Ranger District  
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June 1, 1996**

**Dear Meg:**

**Thank you for the opportunity to comment on the Draft Environmental Impact Statement (EIS) for the King George Timber Sale. Wrangell Resource Council (WRC) is a local, public interest, non-profit organization. The purpose of WRC is to educate, inform, and represent the interests of residents of the Wrangell community and surrounding areas on issues pertaining to the use and management of our local resources. We are a member group of the Southeast Alaska Conservation Council.**

**We want to be very clear on one point. SEACC and WRC are not opposed to logging and the timber industry per se. For years we have advocated for a responsible, sustainable timber industry with value-added manufacturing to keep jobs and profits in the local area - jobs and profits which do not rely on government subsidies. By doing everything possible to increase the value of the raw log before shipping it to market we can decrease harvest levels while still providing timber jobs. Simultaneously, decreasing harvest levels to a sustainable level insures that the rest of the economy, the fishing industry, the tourism industry, subsistence,**

biodiversity, and the wilderness values which make the Tongass such a wonderful place to live will be here for future generations.

Our preferred alternative is No Action (Alternative 6). We feel that this area of Etolin Island needs to remain as it is for several reasons. Extensive cutting has been done on the central portion of the island, the southern end is wilderness, and the north end will be the only area on Etolin left relatively uncut. The Draft EIS states that Alternative 6 "would not contribute to local employment or income". What about the fisheries, trapping, guided hunting, tourism? All these will be better off with the No Action alternative, especially if hiking trails are more extensively developed. The value of this area of Etolin is its non-timber, multiple uses - the scenic resources, the recreational resources, the fishing resources, the wildlife resources, the cultural resources, the resources of the freshwater systems in the area.

In the Draft EIS, it is mentioned that with Alternative 6 there is "no potential improvement possible of the existing clearcut" (p. 3-5). Why the concern for this particular clearcut? It makes no sense, when it is a well-known fact that there are several clearcuts on Wrangell Island which could be "improved", and are more easily accessed and could provide employment and income for small timber operators for some time. And, on the map on page 2-12, these clearcuts are described as "Existing Managed Stands". If they are already being "managed", what does "potential improvement" mean?

It is also stated that there would be "no salvage of dying stands of yellow-cedar" (p. 3-5). Why do these stands need to be "salvaged"? Old growth forests managed quite well for centuries without assistance and salvaging of dying trees by humans. Growth and death are all natural parts of the ecosystem, interrelated and necessary.

In Chapter 3, page 15, it is stated that "Closing roads to motorized vehicles would be beneficial to those users seeking improved access without the chance of running into motorized recreational vehicles (people engaged in cross-country skiing/mountain biking/hiking, etc.)". The key words here are "improved access". No matter what the Forest Service intends or says about closing roads or limiting motorized use or access, people transport motorized vehicles by boat to places where roads exist, and the roads ARE used. Furthermore, road access is detrimental to wildlife, especially wolves, martens, and bears.

Finally and most importantly, why does the Forest Service continue to view forests only as a timber resource there to be cut? Why not start realizing that standing forests have a quantifiable economic benefit, if only for the immense amounts of carbon contained in the forests and their soils - carbon which would otherwise be released and contribute to the greenhouse effect. Also, old growth forests cannot be replaced. Trees do grow back in this part of the world, but they do not grow back as old growth forests. In viewing a forest as an asset to be harvested for lumber, pulp, paper, etc., we need to look to the future and think about the trees' value as assets then. In the future we may well value those trees just for being standing trees. Once they're cut, it's a moot point. These trees are publicly owned and we, the taxpayers, have oftentimes paid plenty of money because in the vast majority of cases the cost of the roads alone has been more than the receipts from the timber. We, the taxpayers, have certainly not EARNED money from Forest Service timber sales.

In reviewing the Draft EIS as a whole, the second least harmful alternative is Alternative 1. No roads would be constructed. No Log Transfer Facility (LTF) would be

constructed. All harvesting would be done by helicopter. The total difference in volume between Alternatives 1 and 4 is only 2,100 MBF, and between Alternatives 1 and 3 is 2,640 MBF. The Campbell Timber Sale demonstrated that there was no shortage of bidders on the helicopter sale. Furthermore, as the Forest Service report "Anadromous Fish Habitat Assessment" (AFHA) points out, clearcutting and road building have been, and continue to be, extremely detrimental to fisheries and water quality on the Tongass. It must not be overlooked that the fishing industry in Wrangell is a vital industry, and freshwater systems which support anadromous fish MUST be protected. Because of these factors and because of the areas of high hazard soils in the King George area, helicopter logging would hopefully minimize these hazards.

Another consideration regarding this EIS is that the proposed alternatives 1-5 offer a very narrow range of harvest levels. Alternatives 1-4 range between 888 and 968 acres, and Alternative 5 is 1,356 acres. The EIS states that each "alternative has some units that can be easily logged by both small and large operators" (p. 1-11). Do you know without a doubt that large operators will be willing to take only part of the timber sale? Has this happened in the past? If so, when and where? Can you guarantee that what will be offered to small operators will be in the range of what they can afford financially?

It does not seem entirely accurate for the Forest Service to discuss affected environment and environmental effects by comparing what is presently in the King George area - wildlife, fish habitat, floodplains, riparian areas, etc. - and models generated by the GIS database. Computers are great but they are NOT real-life. Where is your data reviewing areas which have been cut? Does the Forest Service conduct before and after studies of timbering to see what actually happens on the ground in the short term and the long term?

**What did the Forest Service learn about cutting done along the Bradfield River?**

**We urge the Forest Service to continue to pursue timber activities such as salvage sales in areas on Wrangell Island and other islands in this area which have previously been cut rather than continuing to go after our last remaining old growth forests. Yes, we agree there is a need for the timber, but let's get more creative about where and how we get that timber.**

**Respectfully submitted,**

*Marlene Clarke V.P.*

*Pat Taggart*



United States  
Department of  
Agriculture

Forest  
Service

Alaska Region Tongass National Forest  
Stikine Area  
P.O. Box 309  
Petersburg, AK 99833

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File Code: 1950

Date: August 1, 1996

Wrangell Resource Council  
P.O. Box 1727  
Wrangell, AK 99929

Dear Ms. Clarke and Ms. Tagart:

Thank you for your comments on the King George Timber Sale DEIS. I will respond to the issues you raised in sequence.


#### Preferred Alternative

I concur that the 'no action' and 'Alternative 1' are the environmentally preferred alternatives and are so designated in the Record of Decision. However, I have not selected either alternative for the decision because Alternative 5 is responsive to resource protection issues while better responding to the local and regional economic situation (see Rationale for Decision in the ROD). Additional adjustments have been made in Alternative 5 in response to public comments and concerns in the DEIS. These adjustments reduce the amount of roading, reduce risk to water quality, minimize the visibility of harvest treatments on Zimovia face and address road management concerns. I would also like to clarify that the Campbell Timber Sale was offered to KPC under the conditions of the long-term contract. It was not put up for bid, so we do not know the exact number of bidders who may have been interested in such a sale. I do know that such sales require larger operators, capable of supporting the capital investment for helicopter logging.

#### Economics

The King George planning area left in an undeveloped state would continue to provide (or provide in the future) limited local employment from fisheries, trapping, guided hunting and tourism. Currently, the planning area does not support any commercial guiding operations and very limited trapping. I believe that fishery resource values are protected under all alternatives so as not to impair the existing commercial fishery. I acknowledge that some people may better enjoy a future hut-to-hut trail system to Bessie Peak and views of an undisturbed watershed. However, the sale does not impair future development of this system and many people would still enjoy the hike and the views encountered. Views of timber management activities can be seen from Bessie Peak currently.





### Improving Clearcuts

It is possible to slightly improve the appearance of the old clearcut on Zimovia face by softening the straight lines left, with partial cuts adjacent to the boundary. However, you are correct that there are several cuts on Wrangell Island that are 'more deserving' candidates for improvement. In the FEIS, the ID Team has retained the discussion on clearcut improvement but deleted the reference to Alternative 6 forgoing this opportunity.

### Cedar Salvage

I believe that the salvage of yellow cedar presents a good opportunity to provide high-value products while meeting environmental concerns. Cedar snags are very numerous on the Tongass and are part of a natural process as you point out.

### Access

Increased human access from roads may impact wolves, marten and bears. The FEIS acknowledges this. The motorized access restrictions will be effective in stopping motorized use, but walk-in access will be made easier by the roads and cannot be completely mitigated.

### Harvest Levels

The alternatives were formed in response to public issues by harvesting more or less in the various land units. I had the option of dropping or adding one or several units to an alternative that can dramatically influence the range of volumes. For a sale this size, the range of 15-25 MMBF is fairly extensive.


### Monitoring

We have included more information in the FEIS regarding water quality monitoring and its influence on the design of road management strategies and construction standards of this project. Integrating the results of past timber harvest monitoring into our projects is an ongoing activity. The ID Team and I are confident that we have disclosed the impacts of the alternatives.

### Harvesting in Areas Already Cut

Some people echo your sentiments that we need to harvest timber, but not where we have to look at the results or locate it in previously harvested areas. A large percentage of recent harvesting has occurred away from the views of Southeast communities. Sustainable logging needs to be well distributed to avoid over-harvesting some areas. Well distributed populations of fish and wildlife ultimately means that we cannot 'sacrifice' some areas. This premise ultimately leads to well distributed logging.





In the King George Timber Sale, I am trying to meet the need for timber while addressing scenic quality, freshwater systems and habitat conservation values. Even though I realize it is not your preferred alternative, I feel that Alternative 5 (as modified), will strike a balance between the need for timber, and the need to protect scenic quality and other resources. I direct your attention to the Record of Decision that is published with the Final EIS for a more in-depth explanation of the decision and my conclusions.

Sincerely,



ABIGAIL R. KIMBELL  
Forest Supervisor





# Southeast Alaska Conservation Council

SEACC 419 6th Street, Suite 328, Juneau, AK 99801  
(907) 586-6942 phone (907) 463-3312 fax  
email: seacc@alaska.net

June 10, 1996

Meg Mitchell, Team Leader  
Wrangell Ranger District  
Tongass National Forest  
P.O. Box 51  
Wrangell, AK 99929

Dear Ms. Mitchell:

The following comments are submitted on behalf of the Southeast Alaska Conservation Council on the draft environmental impact statement (DEIS) for the King George Timber Sale prepared by the USDA Forest Service. SEACC is a grassroots coalition of 15 volunteer citizen conservation groups, including the Wrangell Resource Council, in 12 Southeast Alaskan communities.

SEACC supports providing wood for small operators based in Wrangell. We support the creation of a high value-added timber industry which employs the maximum number of local workers while providing for a sustainable rate of logging consistent with maintaining other uses of the forest. Given past practice, we would object to this sale falling into the hands of the Ketchikan Pulp Company. The Purpose and Need section of the DEIS fails to indicate the likely buyer of the sale and should, moreover, specify that the sale go to the S.B.A. sale program only.

We are further concerned that the range of alternatives considered in the DEIS do not reflect the ability of existing operators in Wrangell to purchase and operate a sale of this size. An option to consider would be to provide a series of smaller sales, parceled out over a number of years, from this area. The Forest Service needs to take a hard look at ways to supply wood to local entrepreneurs, such as directing wood from timber sales in the Wrangell Ranger District to a consolidation yard in Wrangell, where the logs would be sorted and auctioned off to local processors.

We appreciate your direct response to issues raised during the scoping process. But limiting your analysis to issues raised in scoping is no substitute for a comprehensive and thorough review of the possible environmental impacts of this timber sale. Several key issues seem to have fallen through the cracks of this DEIS's new format. We are particularly concerned that this DEIS fails to adequately address or respond to significant issues such as falldown, highgrading, and providing for the healthy populations of fish and wildlife for subsistence, sport, and commercial users. The issues are so fundamental to managing

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LYNN CANAL CONSERVATION, Haines • FRIENDS OF GLACIER BAY, Gustavus • FRIENDS OF BERNERS BAY, Juneau  
WRANGELL RESOURCE COUNCIL • ALASKA SOCIETY OF AMERICAN FOREST DWELLERS, Point Baker • PELICAN FORESTRY COUNCIL  
ALASKANS FOR JUNEAU • NARROWS CONSERVATION COALITION, Petersburg • TONGASS CONSERVATION SOCIETY, Ketchikan  
CHICHAGOF CONSERVATION COUNCIL, Tenakee • JUNEAU GROUP SIERRA CLUB • SITKA CONSERVATION SOCIETY  
TAKU CONSERVATION SOCIETY, Juneau • PRINCE OF WALES CONSERVATION LEAGUE, Craig • YAKUTAT RESOURCE CONSERVATION COUNCIL



the Tongass for the long-term benefit of all forest users that the Forest Service must address them when developing timber sale projects like the King George sale. Postponing meaningful disclosure or consideration of these issues until completion of the TLMP revision violates NEPA, ANILCA and the TTRA.

The release of this DEIS before completion of the TLMP revision is premature. According to CEQ regulations, 40 C.F.R. 1502.2(f), the Forest Service "shall not commit resources prejudicing selection of alternatives before making a decision." Because a decision on the long overdue TLMP revision is expected by September 1, we believe it is appropriate for the Forest Service to wait until the Regional Forester reviews public comments on how this area should be managed, and makes a decision, before committing this project area to the level of development proposed in this DEIS.

A. The DEIS Does Not Adequately Address Sustainable Logging As Required By 42 U.S.C. Section 4332(2)(C)(iv) Because It Does Not Disclose Or Discuss Falldown.

In order to "fulfill the responsibilities of each generation as trustee of the environment for succeeding generations," NEPA requires the Forest Service to disclose and discuss "the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity." 42 U.S.C. 4332(2)(C)(iv). The Forest Service must comply with the procedural obligation of disclosing complete and accurate information and a reasonable discussion of sustainability in every logging project EIS. Such disclosure and discussion is absent from the King George Timber Sale.

The absence of such an analysis is particularly troubling in this DEIS given the consistent pattern of data, analysis, and experience relating to falldown. The Forest Service has finally confronted this issue in the final supplement to the Central Prince of Wales timber sale, although it evades the crucial issue that arises from understanding falldown: given that significant falldown exists between planned timber volumes and the volumes actually logged, past and planned logging under the Ketchikan Pulp contract is unsustainable. Likewise, existing but undisclosed information on the Chatham and Stikine Areas regarding falldown, lead to the conclusion that past logging under the former Alaska Pulp Contract was also unsustainable.

The discussion of the land base for this sale is woefully inadequate. Where did you get the data contained in figure 3-11, page 3-25? Since you haven't documented your sources, it is impossible to determine why the data contained in the flowchart conflicts with previously released Forest Service information. In Letter to Bart Koehler, Dec. 16, 1989, G. Lynn Sprague stated that "until the revision is completed, we will continue our management under the current plan, using data on which it is built." (See Letter, attached). According to the attached VCU

summary dated 7/27/87, the King George study area contains only 5,548 acres of Sutable Commercial Forest Land. In the DEIS, you claim that there are 7,713 acres of "Sutable". Why is there such a discrepancy between the 1987 information and the figures in the DEIS? If you used data from the 1991 draft supplement, you must also address the consistent pattern of data, analysis, and experience showing that the 1991 draft timber inventory overestimates actual, available timber supply.

B. This DEIS fails to address the proportionality requirements of the Tongass Timber Reform Act.

In the past, independent sales such as the Starfish and Campbell River Timber Sales have gone towards fulfilling the requirements of KPC's long-term contract. Because this DEIS does not explicitly make the timber sale off-limits to KPC under their long-term contract, the DEIS must comply with the proportionality requirements of TTRA. Furthermore, proportionality should be addressed because of wildlife dependence, particularly deer, on timber stands with the greatest canopy structures -- the oldest and rarest tree stands, volume classes 6&7. Impacts to wildlife cannot be fully analyzed unless the public and decision makers know where these high-volume stands are and how the proposed project will affect them.

C. The Forest Service's Willingness To Modify HCAs May Threaten The Wildlife That HCA's Are Supposed To Protect.

Currently, the Forest Service does not have a comprehensive plan to protect the wildlife that Alaskans rely on for hunting, guiding, subsistence, tourism, and personal use. A panel of national wildlife experts peer-reviewed the May 1993 Proposed Strategy by the interagency viable wildlife committee in 1994. Although the peer review gave the Committee's draft strategy "high marks", they concluded that the draft strategy does not go far enough. In particular, the peer reviewers were "very concerned" that while additional work is under way "immediate" steps be implemented to preserve important landscape level options. In response to the peer review, the Committee made some "immediate" recommendations designed to preserve planning options pending completion of the TLMP revision. The Forest Service then prepared a draft amendment to the TLMP which did not disclose the Committee's recommendations or provide a reasonable explanation for why they were not considered. SEACC submitted comments on the draft TLMP amendment to the Regional Forester on December 15, 1994. We ask that those comments be incorporated into this planning record.

The peer review's main recommendation was to enlarge the size of the habitat conservation areas. One of the HCAs proposed by the interagency committee lies directly adjacent to the project area on North Etolin island. By failing to consider enlarging this HCA to include lands within the project area, you are ignoring

Meg Mitchell  
June 10, 1996  
Page - 4

the recommendations of the peer review. The 500 foot coastline buffers in the project area also fall short of the interagency committee's recommended buffers of 3300 feet, pending completion of TLMP. The effect of expanding this beachfringe buffer on providing for sustainable use of fish and wildlife by local residents needs to be considered.

D. The DEIS fails to fully incorporate protective measures recommended by the Anadromous Fish Habitat Assessment.

While we appreciate the attempt to reconcile the DEIS with Anadromous Fish Habitat Assessment's recommendations, not all of AFHA's recommendations are followed in this timber sale. Before a large-scale disturbance occurs in this highly productive watershed, you must perform a full watershed analysis, as strongly recommended by AFHA. AFHA also emphasized the protection of headwater streams and high-hazard soils. Your treatment of these headwater areas doesn't compare with the riparian options developed by the TLMP team to implement the recommendations of AFHA. Therefore, we recommend that you hold off on the planning process until the TLMP revision is complete. We also suggest that you use the project area as a control for the Wrangell Ranger District by performing a full-blown watershed analysis of the project area.

Thank you for considering these comments.

Best Regards,



Marc Wheeler  
Special Projects Coordinator



Reply to: 1920

Date: DEC 16 1988

Mr. Bart Koehler  
Executive Director  
Southeast Alaska Conservation Council  
P.O. Box 1692  
Juneau, AK 99802

*BART*  
Dear Mr. ~~Koehler~~:

The information on operable and suitable acres and annual volumes by VCU on the Tongass National Forest that was provided to you on August 4, 1987, is still the most current information available. As you know, we are in the process of building a newer data base in the revision of the Tongass Land Management Plan. However, until the revision is completed, we will continue our management under the current plan, using the data on which it is built. When updated data on the Tongass is available, we will be glad to share it with you. Please let me know if you have further questions.

Sincerely,

G. LYNN SPRAGUE  
Deputy Regional Forester



Mr. William R. Shoaf  
6526 Rogers Pass  
Ketchikan, Alaska 99901

9/17/94

Dear Mr. Shoaf:

I am K. Norman Johnson, Professor of Forest Resources, Oregon State University, Corvallis, Oregon. At the request of the Association of Forest Service Employees for Environmental Ethics, I have reviewed issues surrounding the Central Prince of Wales Island (CPWI) timber sale project.


In terms of my credentials, I have studied forest management planning for over 20 years at various universities throughout the West. I am principal author of FORPLAN, the forest planning model used by the Tongass National Forest and other National Forests. I am coauthor of Forest Management (3rd edition) which is the most widely used forest management textbook in North America. I am senior author of the Gang-of-Four Report, a Congressionally mandated study of the alternatives for the management of the old growth forests of the Pacific Northwest. Finally, I recently was in charge of estimating sustainable harvest levels and short term sale levels as a member of FEMAT, the science assessment underlying the President's plan for federal forests of the Pacific Northwest.

I will comment on one aspect of the controversy surrounding the CPWI: the difference in estimates of available timber volume between the Draft Tongass Land Management Plan (TLMP) and that of the Multi-Entry Layout Plan (MELP). As I understand it, the estimates of available timber volume for the TLMP came from the FORPLAN analysis underlying the plan while those of the MELP came from a detailed aerial photograph survey and field reconnaissance. Further, as I understand, other analysis such as those of the Irland Group Report also suggest that the TLMP estimates are unrealistic.

These findings are consistent with my experience with the federal forests of the Pacific Northwest. Forest Service use of forest planning models like FORPLAN have consistently resulted in overestimates of sustainable harvest levels for a number of reasons. First, the forests being modeled have not been carefully enough studied to remove from the timber base the many special places on the forests where timber harvest will not occur under the standards and guidelines of the forest plans. Springs, seeps, small gorges, elk calving areas, unstable lands and many other lands are often included in the commercial timber base when, in fact, they will not be harvested. Second, models like FORPLAN do not consider detailed spatial relationships often prescribed in the standards and guidelines and which lower the sustainable harvest level. Relationships between cover and forage for wildlife species, as an example, are difficult to represent in these models with any spatial detail.

EXHIBIT

462 - VCU VOLUME CLASS - 0 - 8	8 -20	20-30	30-50	50+	TOTAL
3 - LUD TOTAL CFL	128	5,248	4,352	576	10,304
523 - MA OPERABLE CFL	128	3,149	2,926	532	6,735
SUITABLE CFL	45	2,662	2,433	408	5,548
ANNUAL VOLUME	.349	.577	.147	.000	1.072
463 - VCU VOLUME CLASS - 0 - 8	8 -20	20-30	30-50	50+	TOTAL
4 - LUD TOTAL CFL	60	2,278	1,738	240	4,316
523 - MA OPERABLE CFL	60	1,367	1,170	240	2,836
SUITABLE CFL	60	1,328	1,107	231	2,725
ANNUAL VOLUME	.174	.262	.083	.000	.519
464 - VCU VOLUME CLASS - 0 - 8	8 -20	20-30	30-50	50+	TOTAL
4 - LUD TOTAL CFL	125	3,869	4,243	624	8,859
523 - MA OPERABLE CFL	125	2,578	2,870	624	6,197
SUITABLE CFL	106	2,338	2,652	571	5,666
ANNUAL VOLUME	.306	.628	.206	.000	1.140
465 - VCU VOLUME CLASS - 0 - 8	8 -20	20-30	30-50	50+	TOTAL
3 - LUD TOTAL CFL	951	6,278	1,712	65	5,612
523 - MA OPERABLE CFL	548	3,939	1,686	65	4,440
SUITABLE CFL	270	2,062	1,165	23	3,358
ANNUAL VOLUME	.270	.276	.039	.011	.596
466 - VCU VOLUME CLASS - 0 - 8	8 -20	20-30	30-50	50+	TOTAL
3 - LUD TOTAL CFL	951	6,278	1,712	65	9,004
523 - MA OPERABLE CFL	548	3,939	1,116	0	5,623
SUITABLE CFL	270	2,781	666	0	3,717
ANNUAL VOLUME	.364	.158	.000	.000	.522
467 - VCU VOLUME CLASS - 0 - 8	8 -20	20-30	30-50	50+	TOTAL
3 - LUD TOTAL CFL	246	6,885	4,979	246	13,831
523 - MA OPERABLE CFL	61	4,509	3,730	246	9,897
SUITABLE CFL	22	3,492	2,812	216	7,584
ANNUAL VOLUME	.457	.667	.375	.103	1.402
468 - VCU VOLUME CLASS - 0 - 8	8 -20	20-30	30-50	50+	TOTAL
3 - LUD TOTAL CFL	0	6,042	5,161	566	11,770
523 - MA OPERABLE CFL	0	3,064	2,538	438	6,040
SUITABLE CFL	0	2,196	2,177	385	4,759
ANNUAL VOLUME	.288	.516	.139	.000	.942
469 - VCU VOLUME CLASS - 0 - 8	8 -20	20-30	30-50	50+	TOTAL
4 - LUD TOTAL CFL	0	2,681	2,331	175	5,187
523 - MA OPERABLE CFL	0	1,564	1,723	117	3,385
SUITABLE CFL	0	1,490	1,624	114	3,228
ANNUAL VOLUME	.395	.385	.041	.000	.621



United States  
Department of  
Agriculture

Forest  
Service

Alaska Region Tongass National Forest  
Stikine Area  
P.O. Box 309  
Petersburg, AK 99833

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File Code: 1950

Date: August 1, 1996

Mr. Marc Wheeler  
Southeast Alaska Conservation Council  
419 6th Street, Suite 328  
Juneau, Alaska 99801

Dear Mr. Wheeler:

Thank you for your comments and interest in the King George Timber Sale DEIS. I would like to respond to your comments and concerns in the same order presented in your letter.

#### Purpose and Need

We intend to offer this sale as a small business set-aside and as part of the independent sale program. As you are aware, the Forest Service does not control which buyer actually is awarded the sale. A large business can be awarded the sale if no small businesses bid. The NEPA issues revolve around the impacts of harvesting the timber on the environment. These environmental impacts are not dependent on who buys the sale. The purpose and need remains accurate because it states that the need for timber is driven by regional or local needs for timber and jobs.

#### Range of Alternatives

In the FEIS and ROD, I have described an administrative decision to offer several small sales from this project over the next five years. As I point out in the Record of Decision, I believe that a large sale is necessary to establish the infrastructure (roads, stream crossings and log transfer site) which small operators cannot afford to establish (especially those that buy a tree or group of trees at a time). Additionally, helicopter harvest generally requires a capital investment which few small operators (or the taxpayer) can afford. Because of the proximity of the sale to Wrangell, a buyer of the larger sale may choose to hire employees from Wrangell and will likely affect the local economy in various ways (buying goods and services, lodging etc.). After the main sale is complete, approximately 124 acres of smaller harvest units along the road will be made available in <1 MMBF sales over the next five years. Alternative 5 offers the greatest benefits to various potential operators over the next five years. A consolidation yard is a great idea for those persons who are interested in buying one or several logs at a time for specialty wood products. Such buyers are often not interested in logging the timber themselves. Any purchaser of the timber from the planning area could elect to establish such a





yard at Pat Creek LTF, across from the sale area, with minor assistance from the Forest Service. If the market (and interest from local persons) is there to sell logs individually, a prudent buyer will be able to do so easily on their own.

#### Issues

The DEIS and FEIS is responsive to the issues you mention. The format is not a 'new' idea. The Council on Environmental Quality, which advises Federal agencies on NEPA, recommends that EIS's be kept concise and center around the key issues. Although some of the points you raise are important on a Tongass wide scale in forest planning, they are not necessarily relevant to this project. Other 'issues' that you feel were missed are alternative indicators of issues we have disclosed in the EIS.

Falldown- The issue of 'falldown' is an important Tongass-wide issue and an important consideration on larger sale offerings which must heavily rely on existing inventories. In the King George project, existing inventories (in the GIS system) were supplemented by stand exams conducted in the field on the majority of timber stands. Thus, we are confident that our 'inventory' is as exact as it can be and more accurately reflects the number of acres available for harvest in the project area. We do not have a 'falldown' in the total number of acres of suitable land, but our field inventory does differ from the Forest Plan with regards to operability. In general, we found that there were many more acres of 'difficult' and less acres of 'normal' operability than the Forest Plan data base indicates. In the FEIS we have inserted a paragraph immediately in front of Figure 3-11 explaining the sources of our data.

Highgrading- Proportionality is an indicator of the rate of harvest of higher volume class stands which is generally important to the issue of biodiversity and wildlife habitat (Issue 4). We have added more information to Chapter 2 to describe the harvest by volume class in each alternative. A calculation of proportionality is not required by law unless the sale will be offered under the terms of the long-term contract. As we have indicated, this is not the case. However, we received other requests for the harvest by volume class by alternative and have enclosed it in the FEIS. As you can see from Table 2-6 in the FEIS, the proportional change in the volume classes after harvest is less than 1.2% from the inventoried level. The other indicators of the relative differences between alternatives disclosed under the Habitat Conservation issue are more descriptive of the relative differences in alternatives.

#### Relationship to TLMP

We have accounted for the range of options under TLMP in the range of alternatives for the King George Timber Sale. Making a decision about the King George sale area will not prejudice a TLMP decision.

#### Falldown

I am charged with using the best available information I can in making decisions. For this project, we started with the Forest data base and utilized



two years of stand examinations in the field. Because of the availability of field information and the small size of this VCU, this planning area was also part of an experimental study using satellite imagery to collect forest vegetation information. As stated above, I am confident in our numbers and do not anticipate any 'falldown' between the planning and implementation phases of this project. This same topic came up in a meeting between the IDT and several members of your organization more than a year ago. At that time we brought out the maps and showed the results of our stand examination process. The 1987 table you provided with your input likely had a different definition of 'suitability' than we disclose.

#### Habitat Conservation Areas

The King George timber sale does not preclude the possible expansion of HCA's or any of the options for viability being considered under TLMP (including matrix options) because even Alternative 5 harvests less than 20% of the planning area capable of supporting an HCA designation. Most units are located well away from beach and estuary fringes. Those that are next to the beach fringe involve partial harvest techniques. Imposing a 3300 foot beach buffer is fairly well represented by the 'no action' alternative or Alternative 2. I would like to point out that it would also be very difficult for several small sale operators to afford to build road through such an extensive beach fringe to get to the small amounts of timber you propose to have them log.

#### Sustainable Fish and Wildlife Populations for Subsistence

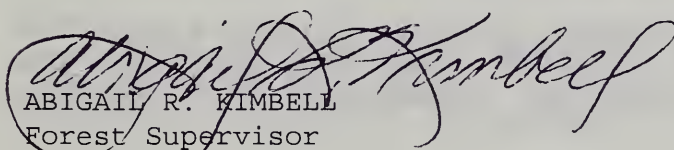
As we have disclosed in the EIS, the King George planning area is not an active subsistence area for Wrangell or any other subsistence community. No comments to the contrary were received to the analysis in the EIS. I believe that our Habitat Conservation and Freshwater System sections in Chapter 3 effectively discloses the effects on Fish and Wildlife species.

#### Watershed Analysis

Our current direction from the Regional Forester states that the recommendations of the AFHA report will only be accomplished to the extent they can be a part of other on-going work, without substantially disrupting or delaying project planning or implementation. The DEIS did complete a thorough assessment of the freshwater system that emphasizes protection of aquatic habitat and we did consider many of the suggestions of the report in our work as disclosed in Appendix E.

I would like to direct your attention to the Record of Decision which highlights some of the adjustments we made in the preferred alternative between the Draft and Final EIS. I also explain my rationale for selecting Alternative 5.

Sincerely,

  
ABIGAIL R. KIMBELL  
Forest Supervisor



*Received  
Hatzel  
6/17/90 mm*

Meg Mitchell  
P.O. Box 51  
Wrangell, AK 99929

Peter Branson  
P.O. Box 2073  
Wrangell, AK 99929

Dear Meg:

Thanks for the opportunity to comment on the proposed King George Timber Sale. As a person born and raised in Alaska and 13 year resident of Wrangell Island I have a great stake in what happens in this area. As I plan to live here the rest of my life I have watched with great dismay and frustration as the Forest Service and the timber industry has converted thousands of acres of the last temperate rain forest on earth into a biologically impoverished tree farm -- a tree farm that will never compete with those already established in warmer, more productive areas. I've also been concerned over our inability to learn from our past mistakes in less recently colonized areas. In particular, the lessons to be learned from the collapse of salmon stocks in the Pacific Northwest, much of the decline a result of deforestation and roadbuilding in salmon spawning watersheds.

Therefore I have been encouraged by changes, however tentative, in the direction of a more sustainable forestry that gives more equal attention to fish and wildlife, tourism, recreation and other uses of the forest. Alternatives to clearcuts, helicopter rather than roads, increased protection of fisheries and wildlife are all trends to be encouraged. However, this sale seems to be a step backwards, particularly with the selection of Alternative 5 as the Proposed Alternative. Alternative 5 has the greatest volume cut, the most road-building, the most road built of high hazard soil, the most visual impact, the greatest sediment threat to fish habitat, cuts the most (25 of 65 acres) of the volume class 7 stand that the state specifically asked not be cut, the worst impact on wildlife, including fragmentation sensitive species, and the worst effect on existing and future recreation and tourism in the area. In addition, contrary to NEPA and requests by the State of Alaska, the range of timber volume does not vary much by alternative. The other four action alternatives are within a few thousand feet of each other, alternatives 3 and 4 by a mere 530 mbf.

1. What was the result of this seasons survey of the suspected goshawk nest? What lessons were learned from the nest in the Starfish sale area that was abandoned subsequent to logging

activities there? In addition to the nest buffer and post-fledgling area, timing restrictions on helicopter flights, logging and road-building in the area should be required.

2. On page 49, chapter 3 of the DEIS, states that "The mandatory 100 foot no harvest buffer excludes harvest from most riparian areas. Alternative 5 has the greatest overlap, followed by Alternatives 3,4,2, and 1, in that order...except for some buffer windthrow risk, no direct impacts to riparian areas of stream channels are expected." Section 103 of the Tongass Timber Reform Act passed by the U.S. Congress in 1990 states that, "In order to assure protection of riparian habitat, the Secretary shall maintain a buffer zone of no less than one hundred feet in width on each side of all class 1 streams in the Tongass National Forest, and on all class II streams which flow directly into a class I stream, within which all commercial timber harvesting shall be prohibited." The law is very clear, any "overlap" into the mandatory buffers is unlawful. In addition, "buffer windthrow risk" is a major threat to fish habitat and a clear indication that a larger streamside buffer is called for. Unit 26 and 23 along with the accompanying road looks like it overlaps the buffer, as well as much of the road and units in the Honeymoon drainage.

3. While partial harvest techniques seem like an improvement over clear-cuts, they are an experimental method and should not be counted on to cut on unstable soil and steep slopes without soil erosion. This is especially true in units at the head of King George creek where naturally occurring windthrow has been observed.

4. I am strongly opposed to the suggestion that fishers be introduced to control porcupine populations. What would this do to martin populations already threatened by logging and trapping? Also, what about predators already here, such as wolves? I could not find reference to the important predator in the entire DEIS. Given this species sensitivity to road density and access wolf populations should have been an important factor in the road debate.

5. Retention areas are supposed to be old-growth. The second-growth beach fringe in the study area cannot be used to fulfill the meager area requirements the Forest Service for "old growth retention."

6. Unit cards are as detailed and as good as I've seen but neither there nor anywhere else in the DEIS could I find any discussion of amounts of the different volume classes to be cut. Without that information it is impossible to determine if the high-grading prohibition in TTRA is being complied with.

7. No information concerning salmon escapement numbers was included in the DEIS. Although subject to many variables beside habitat condition escapement numbers are important data. Past

escapement data is available from Fish & Game and monitoring should include yearly stream surveys to determine escapement and habitat condition. This is one of the few streams in the area that support a sockeye run in addition to the other species of salmon. Both watersheds are too important to risk with road building. Up to 14 critical stream crossings and more than 30 class III stream crossings make the proposed road a major threat to both these salmon streams. As AFHA points out bridges are designed to withstand 50 year flood events only -- what happens to that stream when we get the inevitable 75 or 100 year event?

8. I appreciate your inclusion of the impact on recreational use of Bessie Peak though I found some troubling contradictions. You admit that "views of harvest units will detract from the natural landscape" yet you predict that the proposed roads will attract more use of the alpine. I know very few people that will go to the effort of bushwhacking up a S.E. mountain to get a better view of roads and clearcuts. Your suggestion on 3-12 that a unit on the ridge will act as an "access corridor" and "improve the view" make me think you've never had the opportunity to slog through a hot, ugly, clear cut made nearly impassable by slash and blueberry bushes.

9. The DEIS does not adequately address sustainable logging as required by law because it does not disclose or discuss falldown. The Forest Service must disclose complete and accurate information and a reasonable discussion of sustainability in every logging project EIS. Such disclosure and discussion is absent from the King George Timber Sale.

10. The release of this DIES before completion of the TLMP revision is premature. The F.S. should wait until the Regional Forester reviews public comments on how this area should be managed, and makes a decision, before committing this project area to the level of development proposed in this DEIS.

11. In the economics section you state that state, timber, and fishing jobs are stable or declining and tourism is a growth industry. Yet you seem committed to sacrificing this area to benefit one industry, at the expense of the one industry that shows growth potential. We need areas close to town to draw the lucrative ecotourism visitors-- a hut-to-hut alpine trail on N. Etolin would be a great attraction -- but not if the valley is full of roads and cutting units. Your statement that the no action would "not contribute to local employment and income" is false. Tourism has lots of room for growth in the area, especially if the F.S. developed trails, and left pristine, the salmon streams will be more productive for local fishermen. Other important economic questions were left unanswered: who pays for the roads and LTF? How much will they cost the operator? the taxpayer? who pays for maintenance and for how long?

In conclusion, I would like to see the no-action alternative chosen. But it's pretty clear that the order from above is to "get the cut out", judging from the fact that the sale is listed in your "6 month firm sale schedule" (which frankly makes me question the point of commenting at all). In which case I would like to see a helicopter-only sale, no roads or LTF, no clear-cuts, and low volume (.5 to 2 mmbf). There are plenty of already roaded areas where small sales can be made available for local small operators. The Cambell sale was all helicopter and sold easily with no shortage of bidders-- the same should be true here. Thanks again for the opportunity to comment.

Sincerely,

A handwritten signature in cursive script, appearing to read "P. Branson".

Peter Branson



United States  
Department of  
Agriculture

Forest  
Service

Alaska Region Tongass National Forest  
Stikine Area  
P.O. Box 309  
Petersburg, AK 99833

File Code: 1950

Date: August 1, 1996

Peter Branson  
P.O. Box 2073  
Wrangell, AK 99929

Dear Mr. Branson:


Thank you for your comments on the King George DEIS. I understand your concern for the area and your support of the 'no action' or Alternative 1 for selection. Both these alternatives would have fewer effects on the issues you describe and have been designated as the "Environmentally Preferred" alternatives in the Record of Decision. In the ROD, I describe my rationale for selecting Alternative 5. Even though this is your least desired alternative for selection, I direct your attention to my rationale for selecting it. You are correct that the importance of regional timber supply issues and local jobs are important to my decision. However, equally important is the need to manage the area consistently with its LUD III designation and protect scenery, water quality, fish habitat and wildlife habitat. I believe that Alternative 5 strikes the best 'balance' between the various issues raised by public scoping. The range of alternatives always makes relative comparisons between alternatives. I do not believe that this always means I must select a 'low volume' alternative to be responsive to environmental concerns, such as the one's you have raised in your meetings with the ID Team and letters throughout the planning of this project.

Goshawk

It is not unusual for goshawks to use alternate nests in different years. We do not know at this point whether the goshawks that nested near the Starfish timber sale area abandoned the area completely or simply chose an alternate nest location. We will continue to check the known nest site to see if the goshawks return to nest. If the goshawks do not return to the area, it would not be surprising, given the numerous studies that have shown that goshawks are sensitive to habitat fragmentation.

We will survey the suspected nest location in the King George study area to determine if there really is a nest there and if there is, we will implement mitigation measures according to the Interim Habitat Management Recommendations for the Northern Goshawk, 1992, as required by the EIS. By following those guidelines, we hope to avoid causing goshawks to abandon a nest area. Again, we are not certain yet if there is even a nest in the area.





Timing restrictions on logging would benefit a variety of wildlife; however, unless there are specific reasons for imposing timing restrictions, the cost of the restrictions may outweigh the benefits.

#### Overlap into Buffers

There is no harvest proposed within 100 foot buffers. The overlap that you refer to in the EIS is describing the overlap between harvest units and riparian areas modeled using channel types. The use of the riparian model was evidently a source of confusion for several people. The FEIS includes some clarification of this matter. The riparian model was not used to design buffers. It was used to identify potential overlaps between riparian areas and units or roads outside of the minimum 100-foot TTRA buffer. Potential overlaps were given high priority for field verification. Generally, field verification resulted in finding that the riparian area was adequately protected by the 100-foot buffer. In most cases, the modeled riparian area did not overlap with proposed roads or units. Buffers wider than 100 feet often result from a combination of logging systems operability, logical unit boundaries at the edge of merchantable timber stands, and riparian protection.

#### Partial Harvest on Steep Slopes

We are not using partial harvest cutting prescriptions as a substitute to clearcutting to meet soil stability concerns and we still practice avoiding areas of extreme soil hazard with all harvest activities. Retaining some tree cover and subsequent rooting strength may retain some soil strength over time that would otherwise be lost when the harvested tree roots decompose, but there is no quantitative data to support this idea. It has been suggested that harvest which retains 75% of the canopy would retain the rooting strength over time. Harvest prescriptions which make the stand susceptible to windthrow are not desirable, especially on steep slopes.

#### Fishers

We have no intentions to introduce Fishers to Etolin Island at this time.

#### Beach Fringe Retention

We did not count the acres of second growth along the beach fringe in the retention calculations. It is our intent to manage 500 feet of this area for future old growth beach fringe values which will preclude its future harvest.

#### Proportionality

At the request of several persons who commented, we have provided the acres of harvest by volume class for each alternative in Table 2-6.

#### Fish Escapement

The FEIS includes more information on escapement. Sockeye use is considered incidental in this drainage (one sockeye was recorded during a foot survey in 1989). It is not uncommon to find one or two sockeye in any stream.





## Recreation and Bessie Peak

The analysis in the EIS explains that some people may take advantage of the increased access that roads provide within a fairly short distance of the muskeg systems near the Kunk Lake pass. Not all recreation users are as sensitive to the visual intrusion of harvest units which are predominantly harvested with partial cutting techniques and designed to be less obtrusive than clearcuts. Roads may provide better access, but we do not intend for hikers to make their way through harvest units. One KV project is suggested that may cut a corridor through the overstory removal harvest in Unit 17 to enable walk-in access to the Kunk drainage. However, the feasibility of this option will need to be verified after harvest. Other access routes to Bessie Peak (such as the ridge near Unit 22) could be accessed by walking along the road and then hiking the ridgeline outside the unit. Unit 27, which would harvest the existing ridge currently used as an access corridor to Bessie Peak, is not part of the selected alternative. Thus the existing ridgeline corridor on the King George Creek side is not planned for harvest at this time.

## Relationship to TLMP

We have accounted for the range of options under TLMP in the range of alternatives for the King George Timber Sale. Making a decision about the King George sale area will not prejudice a TLMP decision.

## Economics

The King George planning area, if left in an undeveloped state, would continue to provide (or provide in the future) limited local employment from fisheries, trapping, guided hunting and tourism. Currently, the planning area does not support any commercial guiding operations and very limited trapping. I believe that fishery resource values are protected under all alternatives so as not to impair the existing commercial fishery. I acknowledge that some people may better enjoy a future hut-to-hut trail system to Bessie Peak and views of an undisturbed watershed. However, the sale does not impair future development of this system and many people would still enjoy the hike and the views encountered. Views of timber management activities can be seen from Bessie Peak currently.

Sincerely,

  
ABIGAIL R. KIMBELL  
Forest Supervisor



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